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HANDBOOK OF CUTANEOUS THERAPEUTICS

INCLUDING SECTIONS ON THE X-RAY, HIGH-
FREQUENCY CURRENT AND THE MINOR
SURGERY OF THE SKIN

FOR THE USE OF GENERAL PRACTITIONERS

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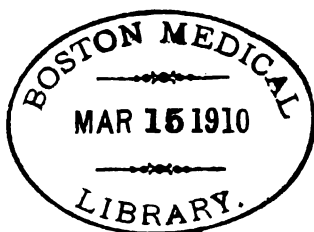
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PREFACE.

THIS book is based upon the descriptive and therapeutic sections of Hardaway's *Manual of Skin Diseases*, which parts, however, have been considerably revised and extended. It is, therefore, proper to state that, with some few exceptions, Dr. Hardaway has written the descriptions of the various diseases and all that relates to their general and medicinal treatment, while Dr. Grindon has prepared the special sections on radiotherapy, the high-frequency current, galvanism, faradism, minor surgical procedures, and, in fact, what may be termed the physical and mechanical treatment. Of course, it will be understood besides that both authors have jointly supervised the work as a whole.

Dr. Isadore Dyer, of New Orleans, has been good enough, in the article on Leprosy, to give the authors the advantage of his exceptional experience in the treatment of that disease, and Professor J. M. Good, of the St. Louis School of Pharmacy, has contributed some useful notes on the preparation of ointments.

A few words on the general plan and scope of this work may be added. In many instances, to make the principles of treatment clear, we have gone very fully into the symptomatology and etiology; on the other hand, where this necessity did not seem apparent, these features have been dealt with in the briefest way. A certain amount of atten-

tion has also been given to differential diagnosis. We have for the most part omitted all mention of rare and unimportant diseases.

This book has not been written for the specialist, but for the general physician, who is necessarily obliged to treat skin diseases, and who demands practical advice. We have, therefore, tried to keep this fact before us, and endeavored to place at the disposal of the physician means and methods that are readily accessible, and have rarely mentioned drugs and appliances that are beyond the reach or skill of the ordinary pharmacist. At the risk of appearing unfamiliar with much of the passing literature of the day, we have avoided mentioning the many novel therapeutic ventures that are often forgotten the week after their publication.

At the end of many of the sections are appended carefully selected formulæ, in addition to those in the text proper—a feature that we trust will prove useful.

In Part II there will be found a fairly full account of the newer methods of treatment, such as the x -ray, the high-frequency current, the opsonic method, electrolysis, etc., together with a brief consideration of the minor surgery of cutaneous disorders.

It is needless to say that, while the text reflects our own personal experiences, we have drawn fully upon the current dermatological journals and year books and the many valuable treatises on cutaneous medicine.

It remains to express our sincere thanks to Dr. C. D. Scott for much valuable aid in the preparation of the manuscript and to Dr. R. H. Davis for similar assistance.

W. A. H.
J. G.

ST. LOUIS, 1907

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ERRATA.

Page 24, line 28, *for* tuberculous *read* tubercular.

“ 25, “ 20, “ tuberculous “ tubercular.

“ 64, “ 10, “ croton oil “ carron oil.

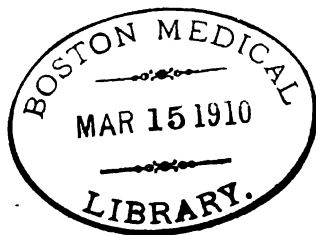
“ 313, “ 30, “ doses a day “ doses 3 times a day.

“ 388, “ 20, “ seborrheicum “ seborrhoicum.

“ 447, “ 6, “ Quinquad “ Quinquaud.

“ 504, “ 15, “ it also has “ they also have.

“ 504, “ 17, “ it has been “ iodide of potassium has been



PART I.

TREATMENT OF DISEASES OF THE SKIN.

INFLAMMATIONS.

THE ERYTHEMATA.

Erythema Simplex. *Description.*—Erythema, using the word in a clinical sense, may be defined as a redness of the skin, which may be made to fade upon pressure. It appears in the shape of diffused or circumscribed, variously sized lesions, generally without appreciable elevation above the integument. It is customary to divide it into the idiopathic and symptomatic varieties.

Idiopathic Erythema.—This form is brought about by the influence of external irritation, and if left unchecked may go on to true inflammation. Among the exciting causes may be mentioned heat and cold, traumatism, and animal and vegetable irritants.

Treatment.—The indications for treatment are sufficiently obvious, namely, to remove, when practicable, the exciting cause and to apply some simple dusting powder or soothing lotion.

Erythema Intertrigo.—This form of erythema is always at first a simple hyperemia of the skin, which occurs in parts of the body exposed to friction from the contact of opposed surfaces, and, in children especially, it is often evoked by the irritation of urinary and fecal discharges. In severe cases the skin is hot and tender, there is a hypersecretion of sweat, the epidermis becomes macerated, and

the parts are bathed in a muciform discharge, which frequently emits a highly offensive odor. Under circumstances of neglect, the surfaces may become fissured, raw, and even extensively ulcerated.

The disease is usually found in the groins, the folds of the neck in fat babies, the gluteal furrows, the inner surfaces of the thighs and flexures of the joints. Intertrigo in infants may appear quite suddenly, and, under proper management, may last but a few hours; on the other hand, if neglected or improperly treated, it may persist for weeks. When it is symptomatic of internal disorders of a grave character, the disease persists in spite of the best-directed efforts at cure. It is most frequently encountered in hot weather, although in infants it may be observed at all times of the year. Relapses are to be expected.

Treatment.—In the management of intertrigo it is also well to remember that the affection may be set up by the dribbling of urine in elderly men with prostatic disease, by the irritating influence of menstrual and vaginal discharges, and by the overflow of milk from distended breasts. Fleishy persons of a gouty habit are very prone to intertrigo, and it is necessary in these cases to look carefully after the diet and to give remedies suitable to the constitutional condition. In obstinate attacks in adults the urine should always be examined for sugar. It is generally easy to prevent the occurrence of an intertrigo. Cleanliness is to be secured by ablutions with soft water and a bland soap, frequent change of diapers in infants, the immediate removal of, and protection against, irritating discharges, and the use of a simple dusting powder (zinci oxidi, ℥ij; pulv. sem. lycopodii, ℥vj). After the disease has become established, it is well to keep the parts separated by the interposition of pieces of lint or thin flakes of absorbent cotton and to apply a powder that is somewhat astringent (thymol., gr. j; pulv. zinci oleatis, ℥j). Duhring advises diluted lotio nigra in obstinate cases. In nearly all grades of intertrigo we have secured the most admirable results with Lassar's paste:

R—Acidi salicylici	gr. xxx
Zinci oxidi,	
Amyli	aa 3vj
Vaselini	3ij—M.

Perhaps a better formula is the modification of the above suggested some years ago by Dr. G. H. Fox:

R—Acidi salicylici	gr. xxx
Bismuthi subnitratiss,	
Amyli maidis	aa 3vj
Ung. aquæ rosæ	3ij—M.

This paste should be spread thinly over the involved surface. It is not only directly curative in its effects, but also affords a most admirable protection from irritating discharges.

Malcolm Morris advises the use of narrow muslin bags containing starch, powdered boric acid, or some antiseptic drying powder. When the skin, in chronic cases, has become thick, the so-called lichenification of the French, plasters of 5 or 10 per cent. salicylic acid may be applied, or the skin may be exfoliated with resorcin. (See Eczema.)

ADDITIONAL PRESCRIPTIONS.

R—Zinci oxidi	3jss
Pulv. camphoræ	3ss
Pulv. amyli	3vj—M.
S.—Dusting powder.	M'Call Anderson.
R—Pulv. acidi borici	3j
Pulv. zinci oxidi	3ij
Pulv. talci	3v—M.
S.—Dusting powder.	Stelwagon.

Symptomatic Erythema. **Description.**—When we bear in mind the anatomical and physiological peculiarities of the skin, and its intimate connection with the system at large, it is quite comprehensible that many morbid states of the organism find local expression in circulatory derangements of the integument. One of the commonest of these disturbances is a superficial erythematous inflammation. Certain general diseases, *e. g.*, variola, diphtheria, cholera,

meningitis, vaccinia, etc., are often preceded, accompanied, or followed by erythematous rashes.

More or less transitory inflammations of the skin are known to occur in consequence of the ingestion of various drugs (**erythema medicamentosum**).

One of the most frequent, and, at the same time, one of the most important in a negative way, of these symptomatic erythemas is the form commonly called **erythema infantile**, or **roseola infantilis**. These rashes generally assume the roseolous form, and are accompanied by a slight elevation of temperature and perhaps some redness, without swelling, of the palate and fauces. They are said to be most common over the sacral region and buttocks.

The symptomatic passive hyperemia, which may result from a variety of agencies, *e. g.*, heat, cold, mechanical causes, pathological states, etc., needs no particular description here.

Treatment.—The treatment of the various forms of erythema mentioned above is the treatment of the general conditions upon which they are dependent. Locally, as in the so-called idiopathic rashes, the use of dusting powders or soothing lotions is usually all that is demanded.

Erythema Scarlatiniforme. **Description.**—This is a disorder in which there is a more or less generalized erythema, followed in turn by peeling of the skin.

The disease is acute or subacute in its course. In the acute type the eruption may be preceded by premonitory symptoms of fever and malaise lasting a day or two, or constitutional disturbances may be absent. The fever, when present, usually abates on the appearance of the rash, or it may continue for some period. The rash is generally scarlatiniform, but it is occasionally morbilliform. The mouth, throat, and tongue may be involved, but the latter does not present the strawberry aspect of scarlatina. The eruption generally disappears in a few days. The subsequent desquamation may be lamellar or branny. Mackenzie makes the important statement that the redness does not disappear altogether when scaling takes place,

which distinguishes this affection from scarlet fever. The desquamation is of short duration, although we have seen it persist for some weeks. Rarely, the hair falls out and the nails are left brittle and furrowed.

The **subacute type** of erythema scarlatiniforme more nearly approaches a true dermatitis exfoliativa. In these cases the systemic reaction is less, the eruption more completely covers the whole body, and a given attack may last for days or weeks.

Recurrence is the rule, although the tendency may gradually disappear. Neither form is contagious nor epidemic.

Causes.—The causes of erythema scarlatiniforme are various, viz., septic infection, gonorrhea, rheumatism, malaria, eating of shell-fish and spoiled meats, and the taking of various drugs. External irritations, as from mercurial inunctions and the topical application of iodoform, sometimes produce it. It may also follow upon surgical operations. Individual idiosyncrasy must necessarily play an important role in its etiology.

Treatment.—The **internal treatment** consists in ascertaining and removing the exciting cause of the disorder. In the absence of any special indications, or in connection therewith, a good routine practice, in acute cases, is to clear out the bowels with a mercurial followed by saline laxatives. Salicin in appropriate doses has seemed to us beneficial after the purgative. In recurrent cases a careful scrutiny of the diet should be made, and it should also be remembered that any drug may be capable of exciting this affection in predisposed persons. We have several patients in whom quinine exerts this untoward effect. In chronic types of the disease, Payne recommends large doses of quinine and the salicylate of sodium, but here also we prefer salicin in 10-gr. doses three or four times a day, or even in larger quantities.

The **local treatment** is usually simple, a dusting powder of talcum generally sufficing to allay the irritation. In some instances, however, the itching and burning are

intolerable, and recourse must be had to antipruritic remedies. The most universally applicable is the compound zinc lotion.

R—Zinci oxidi	3ij
Pulv. calaminæ præp.	3ij
Glycerini	3ij
Liquoris calcis q. s. ad	3iv—M.

S.—Shake. Mop on the surface with a soft rag.

It may be necessary to add to this lotion from $\frac{1}{2}$ per cent. to 1 per cent. of carbolic acid, or a suitable amount of menthol, the latter being first dissolved in alcohol.

Erythema Pernio (Chilblain). **Description.**—Chilblain appears in the form of dusky red or even purplish, ill-defined patches, affecting more especially the sides and backs of the toes and fingers. In a more severe grade of the affection, vesico-papules, vesicles and occasionally bullæ may develop. When from friction or other traumatism the vesicles or blebs are broken, an ulcerated chilblain will result, with the possibility of septic infection.

The subjective symptoms consist of itching, tingling, burning, and pain, usually worse at night. The disease attacks, by preference, the young and the aged, and particularly those having a feeble circulation and of the so-called strumous or lymphatic habit of body, although healthy persons are not exempt.

The disease occurs in winter time, and disappears on the approach of warm weather. Seasonal recurrences are the rule. Chilblain, and the peculiar type of disorder known in England as the "chilblain circulation" are comparatively infrequent in this latitude.

Treatment.—Where indicated, tonics, such as iron and arsenic, may be prescribed, and any other measures calculated to better the general health and improve the circulation may be employed. Stevens and others claim unusually good results in chilblain from the administration of calcium chloride. It is given in extract of licorice in from 10- to 13-gr. doses, three times a day. The feet and hands should be well protected, and tight-fitting shoes and

gloves prohibited. According to Galloway, local massage is beneficial as a preventive measure; and the same authority recommends that the skin should be kept free from perspiration, and some antiseptic powder (such as boric acid, 50 per cent.; siliceous earth, 25 per cent., and powdered rice or starch, 25 per cent.) kept in contact with it. A small amount of camphor or menthol will be a grateful addition to such a powder. In the first stage of chilblain the strong counterirritants so often recommended are to be avoided, or used very cautiously. Duhring advises a weak lotion of *grindelia robusta*, or a compound zinc sulphide lotion (zinc sulphate and potassium sulphide, each 5 gr. to 1 oz.). In our experience the calamine and zinc lotion, to which have been added menthol and carbolic acid, is very satisfactory:

R—Mentholis	3ij
Alcoholis	q. s.
Acidi carbolici	3ss
Zinci oxidi	3ss
Pulv. calaminæ præp.	Div
Glycerini	3j
Liq. calcis	q. s. ad 3viij—M.

In some instances the menthol and carbolic acid may be omitted from this prescription and the simple calamine and zinc lotion mopped on several times a day. Crocker advises painting on later the tincture of iodine, which may be decolorized for exposed parts, but he regards the rubbing in of iodine vasogen as more effectual. For the chronic forms of the disease there are many remedies, mainly of a stimulating sort. Among such remedies may be mentioned painting with the oil of peppermint, pure or diluted with glycerin (1 to 6); Wilson's liniment of the white and yolk of one egg and an ounce each of spirits of turpentine and distilled vinegar; soap liniment, 1 part; tincture of cantharides, 1 part; and a 50 per cent. solution of ichthyol.

If the parts become broken or ulcerated the lesions may

be dressed with oxide of zinc or boric acid salve, or, better still, a 10 per cent. salve of xeroform.

Cleveland met with success in the use of the *x-ray*.

ADDITIONAL PRESCRIPTIONS.

R—Pulv. camphoræ	gr. x
Cretæ preparatæ	ʒj
Olei lini	ʒij
Balsami peruviani	ʒ xx—M. Kaposi.
R—Acidi nitrici diluti, Aquæ menthæ piperit.	aa ʒij—M.
R—Ichthyolis, Resorcini, Tannini	aa ʒj
Aquæ	ʒv—M. Boeck.
R—Balsami peruviani	ʒj
Argenti nitratis	gr. v
Ung. spermaceti	ʒj—M.
S.—For ulcerated chilblains.	Leistikow.
R—Olei cajuputi, Liq. ammon. fort.	aa ʒij
Lin. saponis comp.	ʒiij—M. G. T. Jackson.

EXUDATIVE ERYTHEMATA.

Erythema Multiforme. **Description.**—Erythema multiforme is an exudative affection, characterized by various erythematous, papular, tuberculous, vesicular, bullous, and nodose lesions. Preceding the eruption on the skin, certain well-marked constitutional symptoms will often be present, such, for example, as a general feeling of malaise, sore throat, rheumatoid pains, gastric disturbance, and fever. Very often, however, the eruption will appear without any special accompanying general symptoms.

Sometimes even more formidable affections have been observed in connection with erythema multiforme, such as cardiac inflammations, pneumonia, pleurisy, acute rheu-

matism, etc. The disorder may run its course in a few days or persist for several weeks, or, finally, in rare instances, with repeated relapses, endure for an indefinite period.

The local subjective symptoms consist of burning, itching, and a feeling of tension in the skin. It should be remembered that while many of the different lesions of erythema multiforme may coexist, or may develop from one into the other, any one form of the disease may be alone present, and remain as such throughout. To the different elementary forms represented in the group have been given the following names: erythema annulare, erythema iris, erythema gyratum, erythema marginatum, erythema papulatum, erythema tuberculatum, erythema vesiculosum, erythema bullosum.

It would appear that this disease may attack the mucous membrane of the mouth without any evidence of cutaneous lesions. The most usual site of erythema multiforme is upon the backs of the hands and feet, especially in the papular and tuberculous forms, but it may subsequently, or even from the first, appear upon the rest of the body, and most abundantly around the painful joints. Upon the subsidence of the eruption slight desquamation and even considerable pigmentation may be observed.

Herpes iris and erythema nodosum properly belong to this group of disorders, and will accordingly be considered here.

Herpes Iris.—The eruption usually occurs on the backs of the hands and feet, although the mucous membranes may be affected. The disease consists essentially of a vesicular lesion situated on an erythematous base; the further evolution of this lesion, its enlargement, its subsequent absorption, the development of other vesicular or erythematous rings, and the varying shades of color thus produced are the justification of the term herpes iris.

The disorder tends to disappear in a few weeks, its course being marked by successive outbreaks. Herpes iris is uncommon in America.

Erythema Nodosum.—Before the eruption appears there are usually well-pronounced prodromic symptoms in the shape of malaise, fever, rheumatoid pains, and sometimes sore throat. The lesions come out in two or three crops, and consist of discrete, nodose, painful, inflammatory swellings, varying in size from a small nut to an egg or larger. In some cases they are fairly well defined, but generally not; have a firm, tense feeling at first, but become softer as they decline. In the beginning they are of a red color, at times reddish blue, but in the course of their evolution the lesions may assume the various hues of a bruise. Suppuration never occurs, although the aspect of the nodes is strongly suggestive of pus. The front of the legs is the usual site of the eruption, although it may appear elsewhere. There is no doubt that for erythema multiforme in the widest acceptance of the term there are many and diverse **causes**. The disease has been noted in connection with the **acute specific fevers** and **sypilis**, following **vaccination**, after the injection of **serums** and **antitoxins**, following the ingestion of foods and drugs, as an accompaniment of **septic processes**, and above all in the **rheumatic**, and we should also add as one of the expressions of **la grippe**.

The **etiology** of herpes iris is similar to that of erythema multiforme, although seasonal changes, especially spring and autumn, seem in a greater degree to influence its occurrence. Crocker regards gout as a factor of importance. In our own experience, which agrees with that of Mackenzic, erythema nodosum is in many cases associated with the rheumatic diathesis, although it does occur in connection with infectious diseases and after the taking of drugs, such as the preparations of iodine and the coal-tar derivatives.

Treatment.—There can of course be no **internal treatment** of universal application for erythema multiforme; besides, the disease usually tends to spontaneous recovery in a few days. The rational method of management is to discover the direct or indirect cause of the disease and

remove it if possible. Villemain's recommendation of giving 30 gr. of iodide of potassium daily has not proved of any value in our hands.

If a rheumatic tendency is present, Crocker advises salicin or salicylate of sodium in 15-gr. doses three times a day. When the disease is a complication of la grippe, the benzoate of sodium in the following formula, which we owe to the late Dr. W. C. Glasgow, is of good service:

R—Sodii benzoatis ʒiij
 Spt. ammon. aromat. ʒvj
 Aquæ q. s. ad ʒiij—M.
 S.—Dessertspoonful in carbonated water every two hours.

In the anemic, iron combined with an aperient seems useful. In dispensary practice Startin's *mistura ferri acida* may be prescribed:

R—Magnesii sulphatis ʒss
 Ferri sulphatis gr. iv
 Acidi sulphurici diluti ʒij
 Sodii chloridi ʒss
 Infus. quassiae q. s. ad ʒiv—M.

S.—Tablespoonful in half a glass of water a half-hour before breakfast.

This mixture is very disagreeable, and, therefore, among the more fastidious some more palatable preparation may be employed, such, for example, as a granular effervescing sulphate of magnesium, followed by iron after meals. A combination of drugs devised by Rachford, of Cincinnati, for migraine, has, in our hands, fully met most of the indications present in erythema multiforme. It is now put up in the form of a granular effervescing salt of which each dessertspoonful contains the following ingredients:

R—Sodii sulphatis gr. xxx
 Sodii salicylatis gr. x
 Magnesii sulphatis gr. l
 Lithii benzoatis gr. v
 Tincturæ nucis vomicæ ʒvj—M.

In cases of erythema multiforme where no special causal indications for treatment are to be discovered, Norman Walker regards sulphur, given internally, as of

particular value. In cases of severe vesication of the mucous membrane of the mouth Whitfield gives the B. P. cocaine lozenge and the carbolic acid lozenge together, the former being divided into four parts and limited to one daily.

In the recurrent tonsillitis often seen in connection with erythema multiforme we are in the habit of ordering the following application made to the tonsils:

R—Acidi carbolici ℥xx
 Glyceriti acidi tannici ℥iv—M.
 S.—Apply with a cotton swab.

This preparation should be applied nightly for many months, and even quite young children can be taught to swab their own tonsils. We are fully persuaded of the great value of this application in the prevention of tonsillitis and the ills that accompany that disease.

Erythema Elevatum Diutinum.—Under this title Crocker describes a rare form of skin disease in which are present erythematous, raised, and persistent lesions situated on the dorsal and palmar surfaces of the fingers, the elbow-joints, and buttocks. The lesions are nodules from a small pea to bean size, of a pink color at first, but later taking on a purplish hue. In the beginning the nodules are convex, but afterwards show a tendency to coalesce into lobed infiltrations and flat, elevated plaques. In severe cases, however, distinct nodular tumors are present. The growths are firm and painless. All of Crocker's cases were females, and all were children or young adults. Crocker regards gout and acute rheumatism as etiological factors, and considers the growths as analogues of rheumatic nodules. In a typical case that we saw together the patient was a young girl, the subject of rheumatism and recurring tonsillitis. Some months later she contracted a severe diphtheria and received several large doses of antitoxin, whereupon the nodules speedily and entirely disappeared. In less than a year they reappeared, but did not attain their former size, and soon again disappeared spontaneously. Whether the

diphtheria or the antitoxin bore any causal relation to the disappearance of the lesions is a matter of speculation.

Treatment.—The treatment is regarded as unsatisfactory. Crocker suggests arsenic internally and the local application of liquor carbonis detergens. In the case referred to above, we advised salicin internally and the local application to the tonsils, every night for months, of the glycerite of tannin and carbolic acid mixture mentioned under erythema multiforme.

ERYSIPELAS.

Description.—Erysipelas is an acute, contagious inflammation of the skin caused by the streptococci of Fehleisen or other microorganisms, and characterized by certain well-pronounced local and general symptoms.

The disease may be conveniently divided into the simple, or cutaneous, and phlegmonous forms of the malady. Before the local disorder appears there is generally some degree of feverishness or even a distinct chill, followed by elevation of temperature. The degree of the fever and its duration will depend upon the severity of the local manifestation. The disease is apt to commence about one of the mucocutaneous outlets of the body, such as the nostrils, angles of the mouth, the eyelids, especially the inner canthus, the meatus of the ear, or it may begin in a mole or wart. The initial spot is of a rosy-red color, and this gradually enlarges and creeps forward on the skin with a border that is sharply defined from the contiguous healthy parts, and is appreciably elevated. The affected surface is swollen, especially in regions where there is much loose cellular tissue, *e. g.*, under the eyes, is hard to the touch, presents a tense and shining appearance, and after a while the rosy redness is replaced by a dusker hue, which may in severe cases become livid. If the inflammation is very active, vesicles and blebs form over the patch, which, at first clear, finally become semipurulent and dry up into

crusts. If the contents of the blebs are hemorrhagic it must be looked upon as of unfavorable omen.

As the process advances, the redness of the peripheral extending portion will maintain its integrity, but the central area will begin to fade. Sometimes it may be noted that the outlying parts of the skin will display rounded, reddish patches, that become gradually merged into the original lesions, indicating, as has been generally supposed, the implication of the lymphatics in the spread of the disease. The affection may spread widely, the whole surface of the body being involved, or it may take in only a limited region. Inflammation of the lymphatic vessels and glands is also present, and this symptom may be apparent even before the outbreak on the skin. The subjective sensations experienced by the patient are generally those of itching, tingling, burning and a feeling of great tension. Spontaneous pain may be entirely absent, but the parts may feel quite sore to the touch, and in some cases marked hyperesthesia is present. The degree of fever will depend to a great extent upon the local inflammation, and its disappearance coincides with the subsidence of the latter. At the conclusion of the local process desquamation in large or small scales ensues. Erysipelas occurs in all grades of severity, and the process may last from a day or more to three weeks or even longer. Sometimes one attack is speedily followed by another, and in a very mild form of the disease, occurring on the face, relapse develops with great frequency.

Phlegmonous erysipelas is a much more severe variety of the disease, and differs from the simpler form in the greater intensity, both local and general, of the process as a whole. Purulent infiltration and sloughing of the tissues generally occur.

Prognosis.—The prognosis of cutaneous erysipelas is generally favorable; but serious complications may arise in the simplest cases, and the gravity of the disease is increased if it occur in connection with preëxisting disorders. Erysipelas of the head and neck may prove

dangerous from cerebral complications, or implication of mucous surfaces.

Treatment.—In mild cases of the disease **internal medication** is rarely called for; in more severe attacks the strength of the patient must be kept up by suitable nourishment, and, when adynamic symptoms set in, by appropriate stimulation. The tincture of the chloride of iron has been looked upon as almost a specific, given in large doses, from 20 to 60 minims, every few hours, day and night. It must be said that experience as to its utility widely differs. Da Costa extolled the fluidextract of jaborandi, or pilocarpine $\frac{1}{2}$ gr. hypodermically, but warned against its use in debilitated subjects, or those having a weak heart. Aconite and belladonna have their adherents. Quinine has again recently been brought forward as almost a specific. Phenacetin is valuable when the fever is high. Injections of antistreptococcic serum, about 10 c.c., have been given in serious cases, with apparently favorable results. As in all diseases that run a variable course, the results of treatment, both local and internal, in erysipelas, are very variously interpreted, and the sources of fallacy are numerous.

The greatest number of **local applications** have been employed, but lack of space forbids their enumeration. The disease apparently may be jugulated by many remedies. We believe the best plan is to use some preparation that will thoroughly protect the part from all sources of external irritation, and that will give the most comfort to the patient. Among such remedies may be mentioned the white paint applications of Barwell, the use of flexible collodion, and the chalk ointment of Duckworth. This latter is made by mixing together equal parts of benzoated lard and prepared chalk, the lard being first melted, and then adding, to each ounce thus prepared, $\frac{1}{2}$ drachm of pure carbolic acid. This should be thickly smeared on, and covered with a piece of borated lint. An application recommended by Unna, and which we have found serviceable, is as follows:

R̄—Ichthyolis,
 Ætheris āā 3j
 Collodii flex. 3ij—M.
 S.—Apply with a camel's-hair brush.

The same drug may be used in an aqueous solution of 10 to 25 per cent. or in the form of an ointment in the same strength. Credé's ointment has also been found of service.

White highly recommends, in facial erysipelas, a lotion of carbolic acid 1 drachm, to alcohol and water of each 8 ounces. This should be applied on cloths and renewed every alternate hour. A poultice made by dipping a thin layer of absorbent cotton in a 2½ per cent., solution of carbolic acid makes one of the most agreeable and useful applications in erysipelas. The cotton should be covered with rubber tissue. Among the mechanical modes of treatment may be mentioned compression with adhesive straps along the extending border of the disease, and the Kraske-Riedel scarification method. Efforts at limiting the spread of erysipelas by solutions of nitrate of silver, tincture of iodine, etc., are perhaps only useful in those cases that naturally limit themselves. Finsen's negative phototherapy has been used here as in smallpox.

ADDITIONAL PRESCRIPTIONS.

R̄—Acidi borici 3j
 Acidi carbolici gr. xx
 Resorcini gr. x-xv
 Alcoholis,
 Aquæ āā 3j—M.
 S.—External use. Stelwagon.

R̄—Acidi tannici,
 Camphoræ āā 5ss
 Ætheris 3v—M.
 S.—External use. Jesner.

R̄—Ichthyolis gr. xxx-xl
 Resorcini 3ss
 Ung. hydrargyri 3iv
 Adipis lanæ hydrosi 3v—M.
 S.—External use. Roswell Park.

R—Extracti grindeliæ fluidi 3j
 Aquæ 3xv—M.
 S.—Apply on cloths and allow to evaporate.

ERYSIPELOID.

Description.—According to Rosenbach, erysipeloid is a disease due to wound infection with foul animal matter. It is oftenest found in butchers, dealers in fish, cooks, tanners, etc., and is usually observed upon the hands.

The affection begins, with some degree of itching, as a red spot that gradually advances over the surface, but as it extends peripherally, the central portion undergoes involution, and in this way rings and half-circles are produced. The lesion is but slightly elevated, although clearly defined against the healthy skin. The surface over which the disease process has marched is left apparently normal, and shows no desquamation or other secondary effects. Erysipeloid is without systemic reaction, and tends to spontaneous recovery in one or two weeks. Elliott recommends, as a perfectly satisfactory **treatment**, the application of diachylon ointment (unguentum vaselini plumbicum), to which has been added 15 per cent. to 25 per cent. ichthyol. Other remedies, such as salicylic acid, formalin, permanganate of potassium, pyrogallol, and the mercurials may also be noted as useful.

PELLAGRA.

Definition.—An endemic constitutional disease presenting erythema, followed by scaling, infiltration, pigmentation, and, later, atrophy; together with gastro-intestinal, nervous, and other general phenomena.

Description.—Three stages are generally described:

First Stage.—Malaise, lassitude, debility, and low spirits are followed by erythema on the backs of the hands and

feet, neck and face, developing within twenty-four hours and usually persisting from ten to twenty days, when scaling commences. Sometimes there is thickening and pigmentation without preceding redness. There may be vesicles, blebs, and petechiæ.

The broad, thick, dark scales, on detaching expose a coffee-and-milk pigmentation. The infiltration and darkening of the skin become more marked after each attack, until after several seasons the thickening gives place to atrophy, the skin assuming the aspect of old age.

Each year with the approach of winter the symptoms disappear, to return with increased severity with the following spring.

Second Stage.—Pigmentation increases and the skin becomes excoriated and fissured, and moist or scaly. There are anemia, ptyalism, anorexia, thirst, nausea, indigestion, abdominal pain, and diarrhea. The tongue is red and splits. Later there supervene emaciation, weakness, fever, insomnia, sad dreams, and vertigo, followed by headache and backache, delirium, tremors, loss of memory, and melancholia.

Third Stage.—The phenomena of the second stage increase in severity and insanity is common. Death may come early. The average duration of the disease is five years.

Etiology.—This disease is common in certain country districts of Italy, but only one case has been observed in this country, so far as we can learn. It is attributed to poverty, with all that that word implies, and especially to the use of spoiled maize as food, although cases have been observed in which that factor could not be invoked. The direct rays of the sun seem to play a part in the production of the cutaneous symptoms. Pisenti and Mandolesi found *uncinaria* larvæ in a number of cases in which anemia was a marked feature. Harris in this country observed pellagra-like symptoms in a case of *uncinariasis*. K. Ziegler obtained *Aspergillus fumigatus* in cultures from tissues of 21 cases out of 28.

Prognosis.—The disease is generally fatal. Mild cases and those that have passed through only one attack may recover.

Treatment.—More abundant food of a nutritious and easily digested quality, abstinence from spoiled maize, the avoidance of dampness on the one hand and of the direct rays of the sun on the other, proper ventilation, and removal if possible, from the infected district, are the chief factors that may bring about a cure. Gastro-enteric symptoms, when present, call for sedative and soothing remedies. Bitter tonics, iron and cod-liver oil are demanded in chronic cases. Arsenic is sometimes followed by marked improvement. Serious nervous symptoms may call for the use of opium.

FURUNCLE.

Description.—A boil or furuncle is due to an acute phlegmonous inflammation of the skin and connective tissue surrounding a skin gland or follicle, which in turn is followed by suppuration and the extrusion of a central slough, called the core.

The clinical symptoms of a boil are too well known, and too often experienced, to need any further mention. Boils occur singly or in groups; they often come out in successive crops, and for long periods, constituting the conditions known as furunculosis. Any part of the general surface may be the seat of attack, except the palms and soles, but boils show a marked predilection for the back of the trunk and neck. It is now conceded that furuncles are due to the entrance of pus cocci (*Staphylococcus albus et aureus*) into the openings of the skin glands or hair follicles.

Boils are more frequently encountered in men than in women, and, as a rule, are observed less in infants than in boys and young adults. Local irritation, due to the chafing of the skin from rough garments, decubitus, etc., often give rise to solitary boils.

Furunculosis of the nape of the neck is, we think, mainly

due to infection from the soiled fingers of barbers or from the dirty implements of their trade (see especially carbuncle). Sweaters, swimming drawers and other garments worn by men in training and in athletic games, often become infected and set up boils in unusually healthy subjects.

Furuncles complicate many diseases of a depressing nature, such as diabetes, variola, typhoid fever, etc. Severe pruritic disorders, which occasion scratching with the finger-nails, are often complicated or followed by boils, as, for example, eczema and scabies.

Medical men, especially those engaged in making surgical dressings, have appeared to us to be especially prone to a furunculosis of the extensor surfaces of the arms from the wrist to the elbow.

Prognosis.—The prognosis of boils is usually good. When they occur in crops, even if the patient is otherwise well, they may prove very persistent, and even appreciably depress the general health. When boils appear in connection with serious systemic disorders, their presence materially increases the sufferings of the patient.

Treatment.—In all cases, particularly those of a chronic sort, it is wise to investigate the hygienic surroundings and general health of the patient. If sugar or albumin be found in the urine, suitable measures should be instituted at once for the treatment of those conditions.

All local sources of irritation should be ferreted out and removed. Old smoking jackets, sweaters, and even collars and cuffs of the outer garments should be cast away or disinfected.

Now that we know that boils are due to direct local inoculation, although it may be granted that the condition of the soil is an important factor, there is much less prescribing of the multitude of remedies supposed to be "good for the blood."

The dyspeptic, the constipated, the gouty, the anemic, and the strumous should each receive appropriate treatment. The food and drink should be properly regulated.

Leredde recommends Carlsbad salts for obese people who are gross eaters.

There are certain remedies that, given **internally**, are said to have some specific effect on boils. Yeast is an old-fashioned "cure" that sometimes seems to have a decided effect. An adult may take a half-wineglassful night and morning. Sulphide of calcium may perhaps have some germicidal properties when taken internally, but it should be given in much larger doses than is common. Dilute sulphuric acid in 10- to 20-drop doses, well diluted, is much esteemed by some physicians.

Medicines that improve the general nutrition, thus rendering the tissues more resistant to local infection, are of unquestioned value in furunculosis, *e. g.*, arsenic, iron, cod-liver oil, the hypophosphites and the syrup of the lactophosphate of lime.

Recently A. E. Wright has claimed good results in acne, furunculosis, and sycosis, from the inoculations of staphylococcus vaccine.¹ For a further elucidation of this subject see "The Opsonic Method" in Part II.

In the management of the boil itself, an effort should be made to prevent, or at least limit, suppuration. For this purpose the salicylic acid plaster of L. Heitzman is often valuable.

R—Acidi salicylici	3ij
Empl. saponis	3ij
Empl. diachyli	3j—M.

S.—Spread on cotton cloth.

Bidder, following Hueter, employs a 2 per cent. solution of carbolic acid, with which he makes one or more injections according to the size of the boil. This is a good method, but painful. Iodine may be applied in successive layers, and allowed to encroach a little on the healthy skin.

An electrolytic needle inserted into a commencing boil will often abort it. If a hair occupies the centre of a furuncle it should be plucked. Stelwagon recommends an

¹ British Medical Journal, 1904, p. 1075.

ointment or aqueous solution of ichthyol, 25 per cent. strength, kept constantly applied, as sometimes of value as a jugulator. Boric acid may be similarly employed.

Unna's mercuric-carbolic plaster often succeeds in aborting a boil; but if suppuration has already begun, nothing succeeds so well in hastening it. A hole should be cut in the centre of the plaster corresponding to the apex of the boil.

When boils are very painful the common practice is to apply a flaxseed poultice to relieve the tension, but unless the poultice is rendered antiseptic by the addition of carbolic acid it is apt to favor reinfection in the vicinity. Much better is the "antiseptic poultice," consisting of a number of layers of gauze saturated in a hot 1 per cent. carbolic lotion and covered with oiled-silk or gutta-percha tissue. The following ointment serves all the purposes of a poultice, and helps to allay the pain.

R—Xeroformi ʒj
 Ung. vaselini plumbici ʒj—M.
 S.—Spread on cotton cloth or patent lint.

Powdered iodoform is more decidedly analgesic, but some patients show an idiosyncrasy in regard to it.

Phenacetin in doses of 5 gr. or more at night is remarkably efficacious in allaying restlessness and pain. It acts much better, we think, than opium.

If incisions are urgently demanded, the skin may be anesthetized by a spray of ethyl chloride. After the boil has burst, the resulting cavity should be dressed on ordinary surgical principles.

It is very necessary, particularly when boils are multiple, to cover the intervening and surrounding skin with the following paste:

R—Acidi borici ʒj
 Zinci oxidi ʒj
 Pulv. amyli ʒiij
 Vaselini q. s. ad ʒj—M.

Washing the skin with green soap and warm water, and mopping on a lotion of bichloride of mercury, 1 to 1000,

often puts a stop to reinfection. Alcohol is a thoroughly efficient and harmless antiseptic for this purpose.

Clean clothing should be put on frequently, and the patient should be warned against carrying infection to other parts with his fingers. Boils in the external auditory canal and at the borders of the lids (styes) usually fall under the care of the otologist and ophthalmologist, but one of us¹ has shown elsewhere that, as regards styes, they frequently are due to infection from a seborrheic scalp, and that their recurrence may be prevented by proper treatment of the scalp itself, namely, with green-soap shampoos and an ointment of sulphur and salicylic acid. (See Seborrhea.) The usual local treatment is to be employed at the same time. A condition of furunculosis on the back of the neck is a source of great annoyance and is most difficult to treat satisfactorily. We believe that for boils in this situation the source of infection is often found in the barber shop, and consequently we are in the habit of directing patients to see to the thorough disinfection of the barber's tools. (For further details see Carbuncle.) If the patient has seborrhea of the scalp, this should be treated, and under any circumstances the hair should be frequently shampooed. Locally, the neck should be washed twice daily with a sulphur, camphor, and balsam of Peru soap, and afterward mopped with a boric acid lotion, Vleminckx's solution diluted as in acne (see Acne), or alcohol.

In intractable cases the parts may be x-rayed with hope of success, taking care to protect the scalp with a suitable shield. Stelwagon suggests the arc light. The opsonic treatment above mentioned may be a last resort.

ADDITIONAL PRESCRIPTIONS.

R—Sulphuris sublimati	. . . . .	gr. jss
Pulv. camphoræ	. . . . .	gr. ½
For one cachet.		
S.—Take three daily.		Robin.

¹ Hardaway.

R—Beta-naphthol, Bismuthi subnitratiss, Magnesii carbonatis	aa	gr. ivss
Ft. chart. No. 1.		
S.—One powder every four hours.		LeGendre
R—Tr. arnicæ	3j	
Acidi tannici	3ss	
Pulv. acaciæ	3ss—M.	
S.—External use.		
R—Acidi carbolici	gr. v-x	
Ext. ergotæ fld.	3j	
Pulv. amyli	3j	
Zinci oxidi	3ss	
Ung. aq. rosæ	3j—M.	
S.—Apply spread on absorbent cotton		Bulkley.

CARBUNCLE.

Description.—A carbuncle is an acute phlegmonous inflammation that terminates in sloughing of the tissues. A carbuncle differs from a boil in being, as a rule, solitary; in the depth of the original point of attack, in the multiplicity of the foci simultaneously involved, in its flatness, its slower growth, greater pain, and profounder ulceration.

Etiology.—The etiology of the carbuncle is similar to that of the boil, and probably concerns the same micro-organisms. Carbuncle most often occurs in those who are in poor health from other causes, but this rule is by no means invariable. There is an especial association between carbuncle and diabetes mellitus.

Elsewhere one of us¹ has called attention to the frequency with which carbuncles are acquired in barber shops, although we think the profession has but little realized the importance of this source of contagion. We have seen many cases of carbuncle, in which the evidence of this transmission was to us, at least, indisputable. While, of course, carbuncles may be got in a variety of ways, and may be situated in a variety of places, being due to the

¹ Hardaway, St. Louis Courier of Med., December, 1903.

same microorganisms that produce boils, it is a noteworthy fact that women, who do not frequent barber shops, rarely suffer from them, and that the lesions occur in the majority of cases on those parts of the body most exposed to infection, *e. g.*, the nape of the neck, and not so infrequently on the bearded face. Since carbuncles are most formidable and dangerous affections, especially in diabetics and the debilitated generally, the possibility of transmission by the barber should be remembered and precautions taken to prevent it.

Prognosis.—When a carbuncle of ordinary size occurs in a person of robust health the prognosis is good. With increase in size of the carbuncle the outlook becomes graver. In the aged and debilitated, carbuncle is always a dangerous affection. When the disease occurs about the head the prognosis seems to be more doubtful than for carbuncle of other regions.

Treatment.—Since experience has convinced us that a certain proportion of carbuncles, especially of the neck and face, are contracted in barber shops, it becomes a matter of simple obligation to see that the public is protected from this source of contagion, and this duty becomes the more urgent in the case of persons known to be suffering from diabetes. If the laws enacted by various boards of health could be enforced, many of the evils connected with the barber shop would be materially abated. Unfortunately, however, in many places no such laws exist, and one must endeavor to supply their place by private effort.

For many years we have been in the habit of recommending that each patron of a barber shop provide himself with a box containing his own brush and comb, a small package of absorbent cotton, and a 5 per cent. solution of carbolic acid. It being assumed that the barber has first washed his hands, he moistens a bit of cotton with the solution and then thoroughly wipes off his shears; as the clippers cannot be cleaned by ordinary methods, their use should be forbidden. The barber's utensils being cleaned

and the use of one's own brush and comb insisted upon, one is at least in a degree free from the risk of getting the more common contagious disorders. Time and again we have seen these simple measures put a stop to recurrent folliculitis of the neck and other pustular diseases.

A carbuncle once established, there is often present considerable depression of the vital forces, which will necessitate a supporting and stimulating treatment from the outset. Morphine or phenacetin may be required for the pain. The use of sulphide of calcium is highly recommended by some authorities on account of its presumed power of limiting suppuration. A variety of methods for the local treatment of carbuncle has been advised.

Hypodermic injections of a 10 per cent. solution of carbolic acid in oil or glycerin, at several points in the lesion will sometimes, made early, abort a carbuncle. Cotton compresses soaked in a 5 per cent. solution of carbolic acid, and covered by rubber tissue, generally afford relief and often seem to limit the inflammation. Unna's carbolic acid and mercury plaster-mull is unquestionably valuable in the same way; and the same may be said for an ointment of 1 drachm of iodoform or xeroform to 1 oz. of unguentum vaselini plumbicum. Ichthyol applied pure or diluted with 2 or 3 parts of water is also advocated. Crocker states that if a carbuncle is seen at an early stage a solution of carbolic acid, 1 to 30, should be injected subcutaneously all around the lesion, and that if this is done thoroughly the extension is almost invariably stopped. The old-fashioned, and still popular, linseed-meal poultice should never be employed; the lead ointment with iodoform or xeroform may be applied instead, or boric lint wrung out in hot water may be put on and covered with rubber tissue or oiled silk.

Stelwagon's suggestion of the cupping glass to empty a discharging carbuncle impresses us favorably.

In recurring cases recourse may be had to the opsonic method, *q. v.*

In carbuncles of a grave character, with marked systemic reaction, it is idle to waste time with palliative measures. In such cases drastic surgical interference is urgently demanded, such as erosion or complete extirpation. Wood and Taylor claim especially good results with the injection of a saturated solution of pure carbolic acid through the openings into the sloughing tissues. After the sloughs have come away or been removed, the resulting ulcer should be treated on the usual surgical principles.

MALIGNANT PUSTULE.

Description.—Malignant pustule or anthrax is a gangrenous affection of the skin usually appearing upon an exposed part, generally the hand or face, and due to inoculation with the *Bacillus anthracis*, derived immediately or mediately from an animal infected with splenic fever. External anthrax occurs chiefly in butchers, tanners, and woolsorters—persons who come in contact with the flesh and hides of infected animals. Consequently, in suspicious cases the occupation of the patient should be considered.

Generally, from one to three days after inoculation, a red, itching, or burning papule forms, upon which a bulla or pustule soon develops. The bulla or pustule ruptures, exposing a black, gangrenous surface. A crop of vesicles appears around the border of the slough, the skin being red, indurated and greatly swollen, while the neighboring lymphatic vessels and ganglia become enlarged, the latter sometimes suppurating. The gangrenous process may spread rapidly, being accompanied by the symptoms of acute septicemia, and may cause death in one to six days. In favorable cases the slough is cast off, and the loss of tissue replaced by a cicatrix.

Treatment.—The most radical treatment consists in early excision combined with the administration of tonics and stimulants. Injection of iodine and carbolic acid beneath the eschar, and various methods of cauterization

have also been recommended. On the other hand, K. Mueller, D. W. Montgomery, and others recommend an almost entire avoidance of active local interference and especially of excision. Blue ointment may be smeared over the affected surface, and the patient given suitable diet and freely stimulated with alcohol.

EQUINIA.

Description.—This disorder, commonly called glanders, is an infectious disease due to inoculation with the *Bacillus mallei*. The disease has a great variety of forms and symptoms, which cannot be considered in this place. If the specific agent has gained entrance through a lesion of the skin, local pain is experienced, together with erisipelas-like redness of the parts and involvement of the neighboring lymphatics.

Meanwhile, the initial ulcer enlarges, discharges a sanious, offensive pus, and takes on a chancroidal aspect. Later on, erythematous spots come out on the skin, which become converted into variola-like pocks, and sometimes into large blebs. The pustules, which are about the size of a pea, burst, and pour out an offensive, sanguinopurulent discharge. On the other hand, large, projecting tumors and abscesses may develop, that are at first hard and painful, but subsequently become doughy, fluctuate, and break down into extensive, corroding ulcers that penetrate the tissues and expose the bones and tendons. The various skin lesions may occupy the entire surface, which, together with swellings of the joints, present a most horrible picture of suffering. In addition to lymphatic involvement at the site of inoculation, the vessels and glands in other parts of the body become implicated, and, according to circumstances, may undergo resolution, or else suppurate and produce other ill-conditioned ulcers. The cutaneous phenomena may develop in from twenty-four to forty-eight hours, or they may not appear for from two to four

weeks, being preceded by a nasal discharge and certain ill-defined general and local symptoms.

In chronic glanders, if the specific agent has entered some exposed portion of the body, the local phenomena are the same as in the acute form. The constitutional symptoms are also similar wherever the port of entry. It would seem, however, that the stress of the disease in the chronic type is laid upon the skin and certain other tissues of the body, whereas intranasal lesions are absent in at least one-half of all cases. They are, on the contrary, invariably present at some time in the course of acute and subacute cases.

Treatment.—In addition to the immediate destruction of the inoculated surface, when it can be found and reached, by strong caustics or the actual cautery, the general and local treatment should be based on the ordinary principles of medicine and surgery. However, there is but little hope from any treatment in acute cases. The chronic form of the disorder may last from a few months to ten or eleven years (Bollinger), and is fatal in about one-half the cases. Injections of mallein have been given in recent years with some asserted success. Doubtless sterilized emulsions of the dead bodies of the bacilli, administered according to the opsonic method (see Part II), would be efficacious.

IMPETIGO CONTAGIOSA.

Description.—The relationship of the various impetigos to each other, still a *questio vexata* among pathologists, can safely be ignored by the clinician, since the treatment is practically the same for all forms of pyodermia. In this place will be briefly given some of the more striking features of what is called impetigo contagiosa.

The eruption on the skin begins in the form of small, discrete, acuminate vesicles that enlarge to the size of a split pea or twenty-five-cent piece. The contents, which are at first serous, soon become seropurulent. In a few

days the lesions, which are flat or even umbilicated, dry to thin, granular, straw-colored crusts that, owing to the absence of an inflammatory halo, have the appearance of being "stuck on." When the crusts fall off the surface is red, as if from a burn, but scarring does not occur. Instead of beginning invariably as vesicles, the lesions are sometimes vesicopapular, vesicopustular or frankly pustular. In adults the lesions may not develop but remain as papules. Itching is not marked. The mucous membranes may be occasionally involved. The eruption is most prone to attack the face and hands, and may consist of several or many discrete lesions, or, when closely set, they may coalesce and form patches.

Sometimes there may be a slight ephemeral fever preceding the outbreak, but other cases occur in which it is absent. Other varieties of impetigo contagiosa are the **bullous**, in which large pemphigoid blebs are present, which often run together, producing gyrate lesions and, sometimes healing in the centre, extend peripherally by undermining the skin with fluid; and the **circinate**, which presents a narrow, creeping border in which vesication is barely apparent. The condition may strikingly resemble ringworm. The disease attacks children by preference, is contagious, and occasionally occurs quasi-epidemically. Fatal cases have been reported in infants by Brayton, by one of us,¹ and others. It runs its course in from two to three weeks, although it may be kept up indefinitely by repeated auto-inoculation. A rare variety of the bullous form, oftenest encountered in children, is that in which a single, large lesion appears upon a finger, its dense epithelial roof keeping the infection localized.

In our early experience with impetigo contagiosa the disease was, as just stated, practically confined to children, but during the past five or six years the majority of our patients have been male adults, the disease appearing on the face and having usually been contracted in the barber shop.

¹ Grindon.

Treatment.—The management of the ordinary type of the disease as it occurs in children is simple and effectual. After the crusts have been removed by soaking in olive oil, the following salve should be kept constantly on the affected parts:

R _y —Hydrargyri ammoniati	gr. v-x
Vaselini	5ij
Lanolini	3vj

A weak xeroform ointment also acts well.

In pruritic cases, in which the disease is conveyed from place to place by scratching, Stelwagon advises the application several times a day of a lotion consisting of a saturated solution of boric acid, to each ounce of which may be added 5 gr. of resorcin and the same amount of carbolic acid. In extensive gyrate cases Crocker recommends sponging the surface once thoroughly with 1 to 4000 corrosive-sublimate solution, followed by boric acid ointment spread thickly on lint and closely applied. Extensive bullous forms, the so-called pemphigus neonatorum, when occurring with denudation, may be treated like a burn. All clothing should be removed and the child should be laid on flour, a half-inch thick, which is to be changed as often as it gets moist from the discharge. Such surfaces may also be dusted with dry boric acid frequently renewed. Another, and perhaps better, method is to open all bullæ as soon as formed and to wipe them out thoroughly, as well as the whole surface, with 95 per cent. alcohol. One of us¹ successfully treated a bedridden woman of 90 years, whose body was covered with many hundred bullæ, by this means, and has elsewhere reported another case observed in an adult, in every respect similar to so-called pemphigus neonatorum.

A somewhat different method of treatment is to be followed when the disease attacks the bearded face of the adult. Here daily shaving is to be advised, but unless the shaving brush, soap, and cup are thoroughly disinfected

¹ Grindon.

after each operation of shaving, the disease is apt to be kept up by repeated inoculations. To overcome this difficulty we direct the patient to procure some one of the shaving creams that are sold in collapsible tubes and to discard the usual utensils altogether.

As a local application white precipitate may be prescribed in the strength of 10 to 20 gr. to 1 oz. or a weak sulphur and salicylic acid ointment, a 10 per cent. xeroform ointment, or, perhaps, most efficacious of all, citrin ointment diluted one-half with the ointment of oxide of zinc.

For the superficial whitlow not infrequently met with in children suffering from impetigo contagiosa, 5 per cent. or 10 per cent. of xeroform in unguentum vaselini plumbicum gives good results. The salve should be spread on cotton cloth or patent lint, and kept in place by a bandage or finger stall.

In so-called simple impetigo the crusts should be removed, and a salicylic acid ointment of 10 to 20 gr. to 1 oz. of vaselin applied.

ADDITIONAL PRESCRIPTIONS.

R—Acidi salicylici,	3ss
Vaselini	3j
Zinci oxidi,	
Amyli	aa 3ss
S.—Apply after removal of crusts.	Lassar.
R—Ung. hydrargyri nitratis	3j-3iij
Creasoti	m v
Vaselini	3j
	Payne.

ECTHYMA.

Description.—In this disorder, which most authorities refuse, properly enough, to recognize as a distinct disease, are to be observed large, flat, somewhat flaccid pustules of a yellowish or yellowish-red color, varying in size from a ten-cent piece to a silver quarter-dollar, and sur-

rounded by a well-defined areola. Desiccation is rapid, and when the brownish crusts are removed, a slightly excoriated surface is seen, which is covered with a yellowish secretion slightly tinged with blood. Marked pigmentation usually follows healing. The legs and thighs are the usual seat of the eruption. Males are almost exclusively attacked. It is closely allied to impetigo and furunculosis, being the result of inoculation with pus organisms, and, like the affections just mentioned, may appear in broken-down subjects, but also in persons apparently in good health, besides following in the wake of local irritations of all sorts.

Prognosis.—The prognosis of ecthyma is always good, recovery generally taking place in a comparatively short time under a judicious treatment.

Treatment.—In persons who are obviously suffering from debility, or who present symptoms indicating any disorder of the general system, the physician should order appropriate tonics, and address his remedies to the organ or organs at fault. The diet should be regulated, cleanliness enforced, a sharp lookout kept up for pediculi, and the general hygienic surroundings improved, if possible.

After removal of the crusts an ointment of white precipitate, 15 gr. to 1 oz., gives prompt relief. As in impetigo contagiosa, the surrounding skin should be disinfected either with a bichloride solution or one of boric acid and resorcin, or with 95 per cent. alcohol. (See Impetigo Contagiosa.) When the lesions are sluggish the following application acts beneficially:

R—Xeroform	gr. xxiv-xlvij
Vasellini	3ij
Lanolini	3vj—M.

Obstinate cases might call for the employment of the opsonic method. (See Part II.)

POMPHOLYX.

Description.—This disease, also called dysidrosis (Fox) and cheiropompholyx (Hutchinson), consists of an eruption of vesicles and bullæ on the hands and feet. Before an outbreak occurs there is usually some amount of burning and tingling, soon followed by the appearance of small, deeply seated vesicles along the sides of the fingers and on the palms, but, according to Crocker, in bad cases the whole hand may be involved. Somewhat more rarely the feet may be attacked. When the lesions are grouped they run together and form blebs. The hand is then stiff and painful. The lesions usually vary in size from a pin-head to a small bean. Generally, within ten days to two weeks, the contents of the vesicles are absorbed, the epidermis is exfoliated, and all that is left of the affection is the dry, red skin where the eruption had been situated. Fox found that, in some instances, this red, scaly condition became chronic, but certainly in most cases the eruption soon becomes normal. Recurrences are common, and it is said that women are more frequently attacked than men. Pompholyx is practically symmetrical. Hyperidrosis is a common symptom and all observers are agreed it is a disease of debility.

Prognosis.—The immediate attacks are always curable, but the tendency to relapse is difficult to overcome.

Treatment.—Internal treatment consists in the administration of tonics, especially iron and arsenic, attention to diet, and the general regulation of the habits of the patient. The following prescription answers very well in many cases:

R—Strychninæ sulphatis	gr. j-ij
Ext. gentiânæ	q. s.—M.
Acidi arseniosi	gr. j
Quininæ sulphatis	3j
Ferri sulphatis	3ij

Div. in pil. No. lx

S.—One pill three times a day.

Robinson regards arsenic pushed to its physiological limit as almost as efficacious as the same drug is in pemphigus. In persons manifestly suffering from so-called debility, with poor circulation and cold, clammy hands and feet, a mixture of the following kind has appeared to be useful:

R—Glyceriti hypophosphitis,
Syrupi calcis lactophosphatis ʒss ʒiij

S.—Two teaspoonfuls in water before meals.

Locally, soothing and somewhat astringent remedies are indicated. While the vesicles or blebs are intact (and they never rupture spontaneously) the zinc-calamine lotion is to be recommended.

R—Zinci oxidi ʒss
Pulv. calaminæ præp. ʒiv
Glycerini ʒj
Liquoris calcis ʒvij—M.

Cheese-cloth cut in suitable strips should be thoroughly wet with this lotion and kept in place by a bandage. If there be much burning and tingling, a small amount of carbolic acid and menthol may be added to the lotion. Afterward, when the skin is red, scaling, and tender, it is advisable to apply the modified diachylon ointment spread on lint and neatly bound on the parts.

Other methods of treatment recommended are diluted black wash, weak compound zinc lotion, weak salicylic acid paste (Duhring), oleate of zinc, or lead ointment (Crocker), and frequent bathing in sublimate solution (1 to 4000), with the application either of a salicylic ointment or a 2 per cent. salicylic dusting powder (Walker). The last-named authority suggests the use of formalin or resorcin soap in the intervals of the attacks to strengthen the resisting power of the skin.

ADDITIONAL PRESCRIPTIONS.

R—Resorcini ʒss
Acidi salicylici gr. xv
Ol. ricini ʒss
Tr. benzoini ʒiv

S.—Paint on several times daily.

Leistikow.

R—Mentholis	gr. ij
Acidi salicylici	gr. x
Emplastri plumbi,	
Emplastri saponis	āā 3jss
Petrolati	3v
S.—Spread on lint and apply as a plaster.	Stelwagon.

HERPES FACIALIS.

Description.—This is an acute, non-contagious inflammatory disorder which appears in the form of one or more groups of vesicles. The eruption is commonly called fever blisters. The vesicles come out suddenly, being preceded, however, by a sensation of burning, tingling, or itching. The contents of the lesions are clear at first, but in a day or two become puriform, although when the light-brown crusts fall off the skin usually shows no sign of scarring. The favorite sites of the eruption are the lips, the angles of the mouth, and the face generally below the mouth. The vesicles also may be seated on the mucous membrane of the mouth, cheeks, tonsils, uvula, pharynx, larynx, conjunctiva, and cornea. Herpes facialis is generally symptomatic of febrile disorders, and is often ushered in with a chill and rise of temperature; in other instances, however, it is the result of gastro-intestinal disturbance or of simple external irritation.

Treatment.—In the majority of cases no **internal treatment** is required; but when relapse is frequent, it is well to enquire into the condition of the digestive tract, and to entertain the possibility of malarial infection. The **local** management of the disorder is simple. As suggested by Winfield, spirits of camphor, or a powder composed of equal parts of biborate of soda and camphor, may be rubbed into the beginning patch and thus prevent the appearance of the vesicle. It is sometimes possible to abort a forming vesicle on the lip by repeatedly rubbing over it a piece of borax. When the vesicles are well out it is important to prevent their premature rupture, and this can be accomplished by mopping on the zinc and calamine

lotion, or, better still, by painting over the parts with a thin layer of Pick's linimentum exsiccans (*q. v.*) to which has been added 10 per cent. oxide of zinc. When the lesions are about the angle of the mouth, especially in children, the patch should be protected with the preparation just mentioned or a thin layer of flexible collodion; otherwise the irritation of saliva, etc., may produce a sore of considerable size.

Walker believes that the tendency to recurrence may eventually be overcome by painting the lesions in every attack with a solution of silver nitrate in spirit of nitrous ether 1 scruple to 1 oz.

HERPES PROGENITALIS.

Description.—Herpes occurring about the genitals is sufficiently characteristic to demand a special description. While very annoying in itself it derives additional importance from the possibility of confusing it with more serious affections of these parts. Usually, before the eruption makes its appearance, the patient is apt to feel some slight burning or tingling which is presently followed by an eruption of vesicles, varying in size from a pin's head to that of a small pea, and in number from two to three to a dozen, but more commonly five or six. The order of frequency as to situation is as follows: the sulcus, the inner surface of the foreskin, the glans, the margin or edge of the prepuce, and, lastly, the shaft of the penis. The vesicles, when situated on the delicate mucous membrane, speedily rupture, and show merely little eroded spots, circularly disposed, and seated on a reddened base. Sometimes the little erosions run together. On the skin the vesicles, as in herpes facialis, do not readily rupture, but become opaque, and dry into a brownish crust, which upon becoming detached leaves a slightly reddened surface. The disease also occurs in women, affecting the mucous surfaces of the pudendum, as well as the outer portion of the labia and the mons veneris.

It is generally held that herpes proenitalis is most apt to occur in persons who have suffered from antecedent venereal disease; but other factors undoubtedly enter into its etiology and must be considered in the prophylactic treatment. Such, for example, are excessive venery, injudicious eating and drinking, gouty and rheumatic tendencies, and various external irritations.

Treatment.—So far as regards the **general** management of this disease the physician should endeavor to discover and remove if possible all predisposing causes. Internally, Wolff recommends the long-continued use—6 to 8 months—of arsenic. Winfield states that in the gouty or rheumatic; a full course of antirheumatic or antigouty remedies will prevent recurrence.

In the **local treatment** care should be taken to avoid cauterization of the lesions, since such treatment is harmful, often producing deep ulcers that may persist for weeks, and it also leads to great confusion in diagnosis. Dusting the surfaces with a little carbonate of magnesia and keeping them apart by dry lint is often all that is necessary. Occasionally, if the surface has become somewhat angry, a bismuth ointment (1 drachm to 1 oz.) is efficacious. If suppuration should occur from undue irritation, a 5 per cent. or 10 per cent. xeroform ointment is demanded. Should there be coincident tenderness of the inguinal glands, rest in bed, and the application of an ointment of iodoform (2 drachms to 1 oz.) over the sensitive glands, will prove useful. A redundant prepuce may be cut off with some hope of success, but we have seen this procedure fail of any permanent result in many cases.

Finally, in the hope of increasing the resistance of the tissues, daily applications of a 3 per cent. tannin or a 5 per cent. alum lotion may be prescribed (Wolff).

Stelwagon advises the daily use of a descending galvanic current of $\frac{1}{2}$ to 2 ma.

HERPES ZOSTER.

Description.—Herpes zoster, zona, or, popularly, shingles, is an inflammatory disease of the skin, which consists of grouped vesicles on a reddened base. The most frequent seat of the disease is around the trunk following the distribution of the intercostal nerves; hence the term zoster, a belt, and the word shingles, from a corruption of cingulum, a girdle. It is necessary to remember, however, that while zoster is most frequent on the trunk, it may occur elsewhere on the body, and presents, more or less exactly, the same symptoms as when it attacks the more classical locality.

Before the outbreak of the eruption, the patient will usually experience considerable neuralgic pain. The eruption occurs in the shape of little erythematous patches, upon which for a short while in the beginning, minute, grouped papules are to be detected, that, however, speedily develop into distinct vesicles. The fully established disorder is very characteristic.

Taking a general view of the eruption, it is seen to be made up of clusters of large, opaque vesicles that have an arrangement not unlike bunches of grapes, only that the branches and twigs are hidden from sight. This is due to the fact that the lesions follow the course of a nerve or its offshoots. The vesicles vary in size from a pin-head to a pea, those that come out last generally being the smaller. Often they appear in large numbers, in which case one or more vesicles may coalesce to form a large bleb. Their contents are at first clear, but eventually grow turbid and puriform. The vesicles do not rupture spontaneously, are more or less umbilicated, and in the course of ten days to two weeks dry up into brownish crusts, which upon becoming detached show a reddened surface, or here and there slight pits. The eruption is in the vast majority of cases unilateral, which fact has given rise to the popular dea that, if the lesions make the circuit of the body, a

fatal issue may be expected. The neuralgic pain may subside on the outbreak of the vesicles, but this is not usually the case, these symptoms often persisting, with local burning sensations, throughout the course; and, indeed, the neuralgia may last, especially in old or feeble persons, for months or years afterward. The disease rarely occurs twice in the same individual, but there are exceptions to this rule.

There are certain variations in the course of the disease, as outlined above. The eruption may run an abortive course, no vesicles being produced at all. Sometimes the vesicles may become hemorrhagic. In old or badly nourished subjects, or from traumatism, ulceration of the skin, and consequent deep scarring may result. Certain trophic disturbances may ensue, and even motor paralysis.

Herpes zoster ophthalmicus may be a very serious affection. Vesicles may form on the cornea, which soon rupture; the exposed tissue takes on purulent infiltration, and pus is often deposited in the anterior chamber. Iritis is generally present. Permanent corneal opacities are apt to result.

Various names have been applied to indicate the anatomical seat of the eruption, namely, zoster capillitii, zoster frontalis, zoster ophthalmicus, zoster facialis, zoster nuchæ, etc. Chronic or relapsing zosteriform eruptions are generally due to a source of continuous reflex irritation and form a distinct class, etiologically considered.

Bärensprung's discovery of changes in the ganglion of the posterior root has been confirmed by Head and Campbell, who found them invariably present. There was acute inflammation, frequently with hemorrhages and destruction of ganglion cells and fibers. To this succeeded acute degeneration, partial or complete, of the posterior root itself, and at times of fibers of the posterior column of the cord. Later sclerotic changes were found in the root, but not in the cord, probably on account of the small number of fibers affected. Similar changes occur in the peripheral nerves. They are, as a rule, secondary to the lesion of

the ganglion, although active inflammatory changes may extend down from the ganglion and root into the nerve-trunk.

Prognosis.—The prognosis of zoster is usually good; one may say invariably so in young, healthy persons, but in the broken-down or the aged, or, if the disease affect the eye, a more guarded opinion should be given. As deep scars are sometimes left, the physician should warn the patient of this possibility, lest they should be attributed to the remedies employed.

Treatment.—It should be borne in mind that zoster, as ordinarily encountered, is an acute, self-limited disease, which, moreover, presents great variations in both local and constitutional symptoms. In children it is mild in character, while in the adult, and particularly in old people, it is apt to be severe, and leave behind persistent neuralgia. Therefore, with these facts before us, it is easy to put the proper valuation on the various so-called specific methods of treatment. We do not believe that there is any remedy capable of aborting zoster; but as the disease is often self-abortive, and always self-limited, it is clear that drugs often secure undue credit. It is fair to state that Thompson, Bulkley, and others claim good results in lessening the severity of the attack by administering the phosphide of zinc in $\frac{1}{4}$ gr. doses every three hours. Van Harlingen states that it is very efficient for the accompanying neuralgia. For the same purpose Duhring advises ten or twelve cells of the galvanic battery. We can confirm his observations, as most decided mitigation of the pain may be obtained in this way. We pay no attention to the direction of the current. The applications should be made once or twice a day, the last one at night, and should last ten or more minutes at each sitting. In adults it is sometimes necessary to use morphine hypodermically, although phenacetin, or phenacetin and salol, usually gives satisfactory results. Jamieson is authority for the statement that, if the character of the premonitory pains be recognized in time, a blister over the spine on the painful side will partially or

completely abort the cutaneous manifestations. Drink-water recommends spirit of camphor in 5-minim doses, on sugar, three times a day. In recurrent zoster search should be made for a source of reflex irritation such as a carious tooth, or rib, osteophytes, etc.

There are many local applications for the relief of zoster. The best in most cases is the flexible collodion, as it eases the pain and protects the vesicles from rupture, an accident that is always to be deplored. In adults, the following combination is useful:

R—Morphinæ sulphatis	gr. v-x
Collodii flex.	ʒj—M.
S.—Paint over eruption.	

Leloir advised alcohol, pure, or an alcoholic solution of resorcin, thymol, and several other drugs in the abortive stage, but it is also claimed that this method is effectual in any stage of the disease and also in herpes simplex. Some of the formulæ used by Leloir are appended:

R—Alcoholis (90 per cent.)	ʒj
Resorcini	gr. x—M.
R—Alcoholis (90 per cent.)	ʒj
Mentholis	gr. xv
Ext. cannabis indicæ	gr. xxv—M.
R—Alcoholis (90 per cent.)	ʒj
Ext. cannabis indicæ	gr. xxv.
Cocain. hydrochloridi	gr. vj
Spiritus menthæ piperitæ	ʒvj—M.

These various solutions are applied by means of pads of wadding, and are frequently renewed. Howard Morrow speaks well of the use of ethyl chloride as a counterirritant for the pain of zoster. An area of the size of a dollar is frozen at a point where the nerve emerges from the spinal column, and, although this usually relieves the pain along the entire nerve, it is better to freeze areas where the pain is localized.

Dusting powders containing morphine or camphor are also advised. Smearing the surface thinly with vaselin, and then dredging on subnitrate of bismuth, make an

agreeable application. Ointments should, as a rule, be avoided. When, however, the vesicles have been accidentally broken and ulcerations occur, the unguentum vaselini plumbicum, with or without xeroform, may be spread on muslin and bound on the parts.

Meredith says that the oil of peppermint, both in the acute stage and for the after-pains, is an admirable remedy. Menthol in ointment or lotion is better still. In our experience the best remedy for the persistent neuralgia that so often follows zoster in adults is the galvanic current applied in the course of the affected nerve. At the same time, tonic treatment, according to the indications present, should not be neglected.

Williams relieved the subjective sensations in one case with *x-rays*. Allen obtained decided relief of pain with the high-frequency current, ironing with the flat hammer electrode both during the disease and for the resulting neuralgia.

ADDITIONAL PRESCRIPTIONS.

R—Quininae sulphatis 3j
 Morphinae sulphatis,
 Acidi arseniosi āā gr. jss
 Ext. aconiti gr. xv
 Strychninae sulphatis gr. j—M.

Div. in pil. No. xxx.

S.—One pill three times a day for the persistent neuralgia of zoster.
 S. D. Gross.

R—Zinci phosphidi,
 Ext. nucis vomicae āā gr. x—M.

Div. in pil. No. xxx.

S.—One every two to four hours. Bulkley.

R—Amyli 3ij
 Zinci oxidi 3j
 Pulv. camphorae gr. xv—M.

S.—As a dusting powder. If there is much pain 15 gr. powdered opium may be added. Head.

R—Ichthyol.,
 Aquae āā 3j—M.

S.—External use. Head.

REPEATING NEURALGIC HERPES.

One of us¹ has called attention to a condition intermediate between simple herpes and recurrent zoster, in which a single group of vesicles occurs at intervals of a few months or a year, always at an unvarying site, so that each attack is an exact copy or repetition of all that have preceded it. The condition occurs on the face, away from mucous outlets, or on the gluteals, is preceded and sometimes accompanied by neuralgic pain, is oftenest seen in adults, and continues to recur for years without scarring. When about the face, search should be made for such sources of reflex irritation as septal spurs, hypertrophied turbinates, carious teeth, or teeth which by being misplaced exert undue pressure on each other, or overlapping protuberances of the gums. The gluteal cases may depend upon some departure from the normal in the rectum or anus. The **local measures** recommended in simple herpes may be used. Mauriac has described an allied condition as *herpès génital névralgique*.

PEMPHIGUS.

Description.—Pemphigus is a chronic, or sometimes acute, inflammatory disease of the skin, characterized by the formation of variously sized bullæ that appear in successive crops. It is a comparatively rare affection. It is difficult to define pemphigus with exactness, since many bullous diseases have been classed under this head; but it may be said that an eruption of blebs does not necessarily constitute a pemphigus. As a matter of clinical convenience the disorder may be placed under the following heads: acute pemphigus, pemphigus vulgaris, or chronic pemphigus, pemphigus foliaceus, and pemphigus vegetans (?).

¹ Grindon

Acute Pemphigus.—There undoubtedly occurs on the skin a bullous eruption more or less grave in character and of relatively limited duration, which goes by the varied names of epidemic pemphigus, pemphigus neonatorum, pemphigus hystericus, etc., but we believe that these conditions represent no substantive affection, and are only expressions of septic processes, drug eruptions, dermatitis factitia, etc. Pernet and others have described an acute pemphigus occurring in butchers or persons engaged in handling hides, in which there is a history of a trifling wound preceding the eruption. Severe septic symptoms develop in connection with the bullæ, and after some weeks the patient usually dies from exhaustion.

Pemphigus Vulgaris, or Chronic Pemphigus.—Constitutional symptoms are not observed in all cases of chronic pemphigus. As a matter of fact, it would appear that the degree of systemic reaction is in indirect proportion to the extent of the local dermatitis.

The individual lesions consist of hemispherical or oval blisters of various sizes. At first they come out as little transparent vesicles, which, however, quickly grow to the bigness of a pea, or go on increasing to the size of a walnut or orange, or one or more bullæ may coalesce, forming a large, irregular bleb. As a rule, however, the lesions vary in size from a hazelnut to a walnut. The bullæ may come out on unaffected skin, or there may be a preceding local erythema at the point of eruption. The lesions arise abruptly, forming tense bladders filled with fluid, which, at first clear, gradually become turbid, sometimes hemorrhagic, and in some cases decidedly purulent.

Each bleb runs its course in from two to eight days.

At the same time that blebs form on the skin they may be encountered on the mucous membranes of the mouth, conjunctivæ, and also in the respiratory and alimentary tracts. The characteristic feature of pemphigus is the manner in which the disease is kept up by successive outbreaks.

Pemphigus Foliaceus.—The blebs are flaccid, and not elevated and tense as in ordinary pemphigus. Their con-

tents are more or less cloudy from the beginning, and in some cases turn purulent. The lesions are not long lived, and soon rupture. When their covering is pushed or slid off with the finger the surface beneath is seen to be moist from the presence of a nauseous, sticky secretion which dries into flaky crusts. The disease spreads slowly but surely, and eventually the whole body becomes invaded. The mucous membrane of the mouth and throat may be affected, the nails ridged or even cast off, alopecia and ectropion develop, and the patient finally sinks from marasmus.

Pemphigus Vegetans.—In this disorder a mucous membrane is usually attacked in the beginning, the initial lesion being situated in the mouth or pharynx, or in the anus or external female genitals, and in the first-named localities is often accompanied by much pain in deglutition. After two or three days, and without any preceding or attendant general symptoms, ordinary pemphigus bullæ begin to come out on the skin. The blebs, instead of drying up in the usual way, become excoriated and give off a viscid, ill-smelling secretion, and, other blebs appearing in their neighborhood, by coalescence form large, raw patches of various sizes and shapes. The lesions, as a rule, show no tendency to healing, but in certain situations, especially where surfaces are in contact, become covered with papillary excrescences resembling condylomata. Superficial necrosis may occur. The disease pursues a chronic course, fresh crops of bullæ appear, and the patient finally succumbs to marasmus or dies from some intercurrent disorder. Some few cases of recovery have been reported.

A somewhat similar condition has been described under the name of dermatitis vegetans, but it differs considerably both in its local and its constitutional features.

Prognosis.—The prognosis in pemphigus is uncertain, a fact which would be expected from a consideration of its varied etiology. A few cases of acute malignant pemphigus have apparently got well under quinine. Under some circumstances, in the chronic form, the disease may

subside in a few months, or again the successive formation of bullæ may continue for life. On the other hand, relapses are not uncommon. In some cases death results more or less speedily, especially in debilitated or elderly persons, from the exhaustion incident to the process, or else from some intercurrent disease. The prognosis in pemphigus foliaceus is invariably hopeless.

Treatment.—In acute pemphigus, rest in bed, nourishing food, stimulants, quinine for the fever, and appropriate tonics are demanded, according to the necessities of the case.

In chronic pemphigus it is of vital importance to keep up the strength of the patient and to secure sleep. Arsenic is regarded as almost a specific by some authorities, but this is by no means the unanimous opinion. Unquestionably in many instances it seems to control the disease, but relapse too often occurs when the drug is stopped. It is seemingly more efficacious in children than in adults, but we do not believe that the bullous eruption in the former represents a true pemphigus.

It is best to give arsenic in solution, and to begin with small doses gradually increased to the point of toleration. The tincture of belladonna given in the same way is a remedy of value in some cases, and it has succeeded in our hands when other agents had failed. Crocker believes salicin to be a useful remedy in pemphigus, and we have come to the same conclusion from our own experience with it. It should be given in doses of from 10 to 30 gr., three times a day, preferably in wafers.

The deodorized tincture of opium is also of much service, given either alone or in combination with arsenic. Opium has been especially recommended by Hutchinson in pemphigus vegetans. Among other remedies that have been employed may be mentioned strychnine (hypodermically), pilocarpine, chlorate of potassium, quinine, and antipyrine. The **local treatment** consists in measures for the relief of pain, the healing of denuded areas, and the proper cleaning and disinfection of the skin. The blebs may be punctured

to relieve the feeling of tension, but the pricks should be made at their bases, so that the roofs may remain intact, in this way serving as a protective covering to the raw surfaces beneath. Simple powders may be dusted on in mild cases, and the parts protected with a layer of absorbent cotton. Great care should be taken to prevent the rupture of blisters, but when such an accident has taken place the raw places may be dressed with simple zinc salve or boric acid ointment. When extensive surfaces are involved, croton oil, to which has been added a small amount of creosote, gives the greatest comfort. Crocker's calamine liniment somewhat modified is also agreeable and soothing.

R—Zinci oxidi	3j
Pulv. calaminæ præp.	℥j
Ol. amygdalæ dulcis,	
Liquoris calcis	aa 3j
Lanolini	3jss—M.

Various kinds of medicated baths have been advised in pemphigus, such as the bran, starch, gelatin, or alkaline bath, or those containing permanganate of potassium, sulphuret of calcium, corrosive sublimate, decoction of oak bark; and, especially for pemphigus foliaceus and pruriginosus, the tar bath. (See Baths.) The continuous warm bath of Hebra may be tried in hospital practice, but it is hardly practicable among private patients.

The lesions occurring in the mouth and throat should receive the requisite attention. Spiegler recommends rinsing the mouth with a decoction of coca leaves, the coca acting both as an astringent and a local anesthetic. Excoriated places may be gently touched with iodine or a weak solution (5 to 10 per cent.) of nitrate of silver. Papillary growths occurring in the axillæ and groins in pemphigus vegetans may be dusted with xeroform or some similar powder, and it is possible that great benefit might be obtained from exposure to x-rays.¹

¹ The local measures recommended for pemphigus vulgaris may be also employed for the foliaceous form of the disease.

ADDITIONAL PRESCRIPTIONS.

R—Zinci oxidi 3j
Talc Venetiani 3j
Vaselini 3ij—M.
S.—External use. Spiegler.

R—Sulphuris præcipitati,
Zinci oxidi,
Amyli aa 3ijss
Vaselini flavi 3vijss—M.
S.—External use. To hasten regeneration of the epidermis.
. Jarisch.

R—Acid. borac. sol. in glycerin gr. xv-xxx
Adipis benzoati 3xxv
S.—External use. Spiegler.

R—Cretæ præparata,
Zinci oxidi,
Olei lini,
Liq. calcis aa 3ijss—M.
S.—Apply as a liniment. Unna.

IMPETIGO HERPETIFORMIS.

Description.—Impetigo herpetiformis is a very rare disease occurring mostly in pregnant women, although a few cases have been observed in males. The eruption usually develops first on the inner side of the thighs and about the groins, navel, breasts, and axillæ.

The local manifestations consist of superficial miliary pustules, which may be discrete, but are usually closely set. They have a tendency to form circular groups. The contents of the pustules, at first opaque, later become greenish yellow, and dry into dirty, brown crusts. While the central pustules are undergoing this evolution, new lesions appear around the border of the patch, and by coalescence large areas become involved. If the crusts be removed, the skin is seen to be red and covered with a new epidermis, moist as in eczema, with a smooth, infiltrated surface, or presenting papillary elevations. The mucous membranes of the tongue, oral cavity, and esophagus may be involved. With

a few exceptions the disease has proved fatal in all the recorded cases.

Treatment.—The treatment, general and local, should be conducted on general principles, that is, quinine for the fever, together with suitable food, stimulants, etc., while the external application should consist of soothing and antiseptic salves, *e.g.*, 10 per cent. xeroform ointment, and the occasional warm bath, alkaline or carbolated. On theoretical grounds the *x*-rays may be recommended. Premature delivery should be advised in cases occurring in pregnant women.

DERMATITIS HERPETIFORMIS.

Description.—Dermatitis herpetiformis, or Duhring's disease, is an inflammatory affection of an herpetic character, the various lesions showing a tendency to group. It is a protean malady, and manifests itself in various elementary forms, such as erythema, vesicles, papules, pustules, and blebs. Any one of these forms may occur alone, or two or more may coexist, or even may merge the one into the other, thus constituting a mixed eruption. Multiformity of lesion is, therefore, a prominent characteristic.

The commonest expression is the mixed eruption with the vesicular type predominating. In some cases, especially those of severe type, certain symptoms of invasion occur, such as malaise, more or less fever and marked pruritus, or these prodromal symptoms may be absent altogether. Again, in some instances during the first few days of an outbreak, particularly when of the pustular or bullous type, grave constitutional symptoms may be present, but violent systemic reaction is unusual.

Itching and burning are the most marked subjective symptoms, while crusting, infiltration, and pigmentation are prominent secondary features. The course of the disease is variable, but usually chronic, relapsing, and of

indefinite duration. The mucous membranes may also be involved.

Etiology.—The etiology of the disease is obscure, although in a general way the disorder may be regarded as a neurosis of the skin; that is to say, nervous shock or nervous exhaustion are factors of much importance in the clinical histories of many of the cases; but it also must be admitted that in a considerable number of instances other predisposing or exciting causes are seemingly responsible, *e. g.*, glycosuria albuminuria, vaccination, etc. Sometimes the general health is apparently unimpaired. Engman has called attention to the occasional incidence of indicanuria, an observation which we have several times confirmed.

Prognosis.—The prognosis is always grave, although temporary relief from the eruption may be obtained, and the patient made fairly comfortable by appropriate treatment. The outlook is more favorable for permanent cure in children.

Treatment.—The treatment, so far as the permanent cure of the disease is concerned, is far from encouraging. Much, however, can be accomplished in the way of mitigating the patient's present sufferings, in shortening the attacks and lengthening the intervals between them. In all cases the patient's general condition should be diligently enquired into, and as far as possible any departure from health should be remedied. The diet should be plain, yet generous, and tea, coffee, alcohol, and tobacco should, as a rule, be forbidden. A pure milk diet is, in rare cases, apparently helpful, but in our experience the majority of patients experience no benefit from it. Intestinal antiseptics are often of value. The following formula makes a good combination.¹

R—Sodii sulphocarbollatis	gr. v
Potassii permanganatis	gr. j
Beta-naphthol	gr. j—M

This pill should be coated with shellac.

S.—One after meals and at night.

¹ This is Starr's modification of Rachford's pill, which is a 1 gr. salol-coated pill of potassium permanganate.

There is no specific **internal treatment**, but arsenic has undoubtedly much influence over the eruption, both in cutting short the attacks and prolonging the periods of freedom from the disease.

It must be given in comparatively large doses or even pushed to the point of tolerance. The more the disease approaches the bullous type, the more beneficial is the arsenic, and we may add that children get more good from it than grown people.

Sometimes the Asiatic pill seems to be more efficacious than Fowler's solution. It must be confessed, however, that very often arsenic in any form proves useless, or may even prove distinctly harmful.

Belladonna in the form of the tincture, given as in pemphigus, may be tried in refractory cases, but it is not nearly so efficient as the first-named drug; yet we have seen it succeed where arsenic has failed. Among other general remedies may be mentioned quinine, salicin, and ergotin. Sulphur long continued, especially in the form of Garrod's compound sulphur lozenges, one three times a day, is worthy of trial. Adrenalin solution has been given hypodermically with asserted benefit. Cannabis indica, 10 to 20 drops of the tincture three times a day, and antipyrine at night in one large dose, has afforded relief in some cases. Phenacetin and salol, 5 gr. each, several times a day, are occasionally useful. Indicanuria should be sought for, and, when found, the indications will be for the restriction of proteid food and the use of saline laxatives. For **local treatment** Duhring regards sulphur in the strength of 2 drachms to 1 oz. of excipient as the most valuable of all external applications in dermatitis herpetiformis, except in the erythematous form. It should be thoroughly rubbed into the affected parts. There is no doubt of its efficacy, particularly in allaying the tormenting pruritus.

Elliott advises ichthyol in the following preparation:

R—Ammonii ichthyolatis	3vjss—xiiij
Olei amygdalæ dulcis,	
Liquoris calcis	āā 3 viij—M.

This may be rubbed in several times a day and allowed to remain on the surface; or lint may be soaked in the lotion and kept in place by a bandage.

A lotion of zinc sulphate, 1 oz. to 1 pt. of water, a preparation of great value in dermatitis venenata, is sometimes useful in this disease also. The following combination of menthol and carbolic acid affords relief from the itching:

R—Mentholis	3ij
Alcoholis	q. s.
Acidi carbolici	3ss
Lotion. zinci oxidi co. q. s. ad	3vj
S.—Mop on gently with soft cloth.	

As an antipruritic remedy, Winfield recommends liquor picis alkalinus in the strength of 1 drachm to 8 or 12 oz. of water, or the liquor carbonis detergens 1 drachm to 4 or 6 oz. of water.

Soothing ointments are sometimes more agreeable than lotions, especially for excoriated places. The modified diachylon ointment, spread on cloth, is suitable for this purpose. In the vesicular and bullous types Lassar's paste is a good application, and we have had much satisfaction from Pick's linimentum exsiccans (*q. v.*), to which has been added 10 per cent. of zinc oxide and 1 per cent. carbolic acid.

General galvanism and static insulation have been suggested.

ADDITIONAL PRESCRIPTIONS.

R—Sulphuris præcipitati,	
Ichthyolis	
Vaselini	aa 3ijss
Gelanthi	3vss

S.—Apply externally in the erythematous type.

Leistikow.

R—Thioli	3ijss
Aquæ destillatæ	3ij—M.

S.—Paint upon eruption with camel's-hair brush; later wash off with pure water.

Schwimmer.

R—Quininæ hydrochloratis	gr. xlv
Ext. belladonnæ	gr. xxijss
Ext. nucis vomicæ	gr. xv
Ergotini	gr. lxxv

Ft. pil. No. 100.

S.—Take two pills twice daily in the intervals between attacks.
Leistikow.

HYDROA VACCINIFORME seu ÆSTIVALE.

Description.—This rare disorder makes its appearance in the first years of life, and particularly afflicts male children. The outbreak usually occurs in summer, and may recur for a number of years, generally ceasing at the age of puberty, if not earlier. Sudden violent changes of temperature, in either direction, or artificial heat, may provoke an attack.

As a rule the eruption is preceded by some slight systemic disturbance, and, perhaps, a burning sensation may be experienced at the future site of the eruption.

It begins either in the form of vesicles, or as small, red elevations which speedily develop into clear vesicles, or bullæ, that often coalesce. Many of the vesicles become umbilicated and are surrounded by a red areola. The centre assumes a dark-blue or black shade, owing to hemorrhage into the corium with subsequent necrosis. Soon some of the lesions become purulent, and in three or four days the necrotic centre is converted into a thick, black, firmly adherent crust, which, when it comes away, leaves a permanent variola-like cicatrix. Usually there is slight, if any, itching. Such attacks generally last two or three weeks, or perhaps longer, owing to the appearance of new lesions. The eruption is usually situated on parts exposed to the sun's rays, viz., the bridge of the nose, cheeks, and ears, and sometimes, when uncovered, the legs.

Treatment.—The treatment is not promising. It has been recommended to use veils of red or tumeric colors to neutralize the chemical rays, or to smear the parts with a brown pigment. During an actual attack the blisters may

be opened and the surface dressed with a modified dia-chylon salve containing 1 or 2 scruples of xeroform or aristol to 1 oz.

EPIDERMOLYSIS.

This is a rare affection and is characterized by the appearance of blebs that occur on the skin in response to some local irritation, even of the slightest kind. This tendency first manifests itself in infancy and would seem to be permanent, although it is said to decrease toward middle life. It is in all probability hereditary and may affect several members of a family. It is most apt to occur in summer, and is often accompanied by hyperidrosis.

The lesions may, or may not, be preceded by itching and redness; there is, however, no disturbance of the general health. The blebs are of various sizes and may be clear, purulent, or hemorrhagic, and disappear without scar formation. Pigmentation has been noted in a few cases. When the finger-ends are involved, nail loss or deformity may ensue. Any portion of the body may be affected, but especially the hands and about joints, these regions being particularly subject to irritation; also localities where there is friction from clothing, as the neck, wrists, etc.

Treatment.—Little can be expected from any treatment. **Internally**, tonic remedies, *e. g.*, arsenic, ergotin, quinine belladonna, etc., have been recommended and may be given a trial. **Locally**, fatty ointments, or baths, followed by dusting powders, may be ordered; and when there is coexisting hyperidrosis, sprinkling with tannoform has been proposed.

ECZEMA.

Description.—Eczema is an acute, subacute, or chronic inflammatory disease of the skin, characterized by multiplicity of lesions and the presence in varying degrees of

itching, infiltration, and discharge. Crusting, scaling, fissuring, and sometimes hypertrophic changes, are to be regarded as secondary results.

It may be broadly stated that eczema always begins as a congestion of the skin, and always ends in desquamation; but between these two conditions there may intervene papulation, vesiculation, pustulation and various secondary alterations. This disease is particularly characterized by its exudation or discharge, in which it bears a close likeness to the catarrhal inflammations of mucous membranes. This exudation possesses the peculiar power of stiffening and staining linen. It is by no means true, however, that eczema is invariably a moist disease, for certain cases never develop this feature, at least spontaneously, but even a dry, papular or erythematous eczema may be made to exude this characteristic catarrhal discharge by the influence of slight external irritation. In a general way eczema may be said to develop symmetrically; thus, if it is found on one hand it usually occupies a corresponding situation on the other, and so on the legs; but it is not invariably and constantly bilateral like psoriasis, for frequently enough it may be seen in large or small patches on indifferent parts of the body. The disease is rarely universal except in very elderly or unusually weakly subjects, and the general health suffers but little, notwithstanding the often free discharge and the nervous erethism induced by scratching and loss of sleep. Eczema is more frequently seen in its chronic form. As in catarrhal inflammations in general, the tendency to relapse is one of its pronounced characteristics.

Symptoms.—The principal subjective symptoms present are itching, and more or less soreness and pain that follow violent scratching or rubbing of the affected parts. The degree of pruritus will vary according to the age of the patient, the extent and location of the disease, and the character of the predominant lesion. Papular eczema is, perhaps, the most and pustular eczema the least annoying in this regard. An acute attack of the disease may be

ushered in with some slight elevation of temperature, but often no such disturbance is apparent; the local disorder, however, will present the ordinary symptoms of cutaneous inflammation, viz., burning, tingling or itching, to be followed by some one or several of the elementary forms of the disease. On the other hand, the disease may, and often does, begin more insidiously, and is subacute from the start. In this latter condition the itching and thickening of the skin is moderate in degree, but at any time a more acute process may supervene, or, the disease continuing, the infiltration and pruritus may become more marked, other secondary changes may occur, and the eczema lapse into a chronic stage that may endure for years.

As already stated, eczema is characterized by a polymorphous eruption consisting of erythema, papules, vesicles, and pustules, and, moreover, any one of these lesions may be present singly, or more or less in combination. Still at times one or another of these elementary forms may so predominate as to establish the anatomical general type of the eruption—for a season at least. These may be briefly described as follows:

Erythematous eczema makes its appearance in the shape of ill-defined, red, and somewhat infiltrated patches, accompanied by burning, tingling, and itching. The shades of color will vary from a light-red to a reddish-purple or even a tawny hue. It is usually confined to limited regions, such as the legs, backs of the hands, inner surfaces of the thighs, under the breasts, and more especially the face. In the lax tissues of the last-named region great swelling of the skin with closure of the eyes often occurs, leading to an erroneous diagnosis of erysipelas.

Papular eczema manifests itself in the form of small, red, acuminate papules that are either closely set on an inflamed base, or else irregularly scattered over the surface. If this disorder become chronic, the lesions lose their separate identity and run together to form leathery, scaly patches; or if the surface have been greatly irritated, an eczema rubrum results. Itching is a marked feature. The

favorite sites for this form of disease are the face and the extensor surfaces. Relapse is common.

Vesicular eczema usually runs an acute course, the lesions consisting of pin-point to pin-head sized elevations of the epidermis, containing clear or, after awhile, opaque fluid. The exudative or weeping stage will often persist after the rupture of the vesicles, which event happens quickly as a rule, either from the development of new lesions or as a general oozing from the raw and denuded surface. On the other hand, the exudation may dry into yellowish, gummy, easily detachable crusts, which, upon removal, show a moist surface underneath.

Under proper treatment the vesicles may dry up without rupture, the integument being left red, scaly, and thickened.

The sites of predilection of this form of the disease are the flexor surfaces of the limbs, the hands, and the sides of the fingers, although it often attacks the dorsal and the palmar surfaces. Vesicular eczema is also comparatively common on the faces and scalps of children.

Pustular eczema may originate directly in the form of pustules, or the pustular lesions may develop from vesicles, or follow in the wake of other primary types. It is to be presumed, however, that pus cocci and a suitable soil are the main factors. It is most frequently found about the heads and faces of children, and also is seen in weakly adults. Itching is not marked. In the shape of a secondary folliculitis the eruption is often seen on the bearded face, in the axillary and pubic regions, and on other hairy parts.

While any one of the types of the disease briefly mentioned above may run its course as such, or may be more or less commingled with other primary forms, it is nevertheless true that eczema, as seen in practice, has usually undergone certain secondary changes as follows:

Eczema Rubrum.—Any of the primary forms of the disease may be followed by this condition, although it is more common after the vesicular and pustular types. As a result of the exposure of the rete from the shedding of the upper epithelial layers, the surface is red, and gives issue to a

clear or turbid, sticky fluid, that is apt to dry into yellow, flaky crusts; or the skin has a bright-red, smooth, and somewhat glazed appearance, sometimes showing small points of ulceration corresponding to ruptured vesicles or glandular apertures. When decided thickening is present, cracks and fissures may be observed, from which issues a serous or sanious discharge. Itching is marked, although generally paroxysmal in character. Eczema rubrum corresponds most nearly with the popular idea of salt rheum. It is most typically seen on the legs of middle-aged people, in the flexures of joints, and on the faces of children.

Eczema Squamosum.—Squamous, or scaly eczema may follow any of the elementary forms of the disease, and is usually indicative of a decline in the activity of the inflammatory process. It occurs mostly in patches of variable size, that are red, infiltrated and covered with large or small scales. It is often encountered on the scalp, on the back of the neck, and sometimes widely disseminated over the body. In many instances, undoubtedly, squamous eczema corresponds to what today is called seborrheic eczema.

Other secondary conditions met with in the course of eczema have received various names that more or less accurately describe the objective conditions present. Thus, when the infiltration is excessive the affection is called **eczema sclerosum**; when there is marked hypertrophy of the papillæ, and the skin presents a diffuse warty aspect, it is characterized as **eczema verrucosum**; if the deeply infiltrated skin is cracked and fissured, the state is termed **eczema fissum**, and finally eczema occurring in children is spoken of as **eczema infantile**.

Ulcerative lesions are not common in eczema, but they may sometimes be observed in unhealthy children suffering from the disease. Boils and abscesses, due to pus infection, may also be noted in similar conditions, and are kept up and disseminated by scratching.

Etiology.—In order intelligently to treat eczema, it is of the utmost importance to appreciate the main facts in the **etiology** of the disease.

Eczema is the most common of all skin affections. No age or social condition is exempt from its attacks, and both sexes suffer equally. Eczema is not hereditary in the sense that syphilis is, but eczematous parents may have eczematous offspring. In such instances the predisposed and susceptible skin is inherited, rather than a so-called diathetic condition.

The disease is not contagious even in the assumed parasitic variety, but an irritating discharge coming in contact with the susceptible skin of another person may provoke it.

A purely local eczema may reflexly determine an attack at some distant point and even induce a general outbreak.

Eczema is not a diathetic condition dependent upon any single state of the general system, whether denominated as gouty, or dartrous, or rheumatic, although any one of these conditions may act as a predisposing cause; but, stated briefly, it may be reasonably presumed that the eczematous subject presents a vulnerable cutaneous system, and that under certain conditions the disease may be evoked by any irritant, internal or external, capable of arousing this susceptibility.

Among the commonly accepted **internal causes** of eczema may be mentioned various derangements of nervous function, *e. g.*, mental shock, extreme mental worry, and nervous exhaustion. Reflex irritation from uterine disorders, the influence of pregnancy, and of the climacteric period, have been regarded as causative factors. Unna recognizes a special nervous eczema of dentition, and G. H. Fox states that an adherent prepuce is often responsible for the disease in children.

Erythematous eczema of the face due to chronic gastric derangements is a notoriously frequent and rebellious form of the affection.

Certain articles of food and drink are capable of inducing eczema, inasmuch as they produce derangements of the stomach and bowels. Gout, lithemia, and other general disorders perhaps act in the same way.

Eczema occurring in middle life is often associated with

diabetes, and less frequently with albuminuria. It is thought by some authorities that malaria has a direct etiological connection with eczema; and asthma is often seen in alternation with attacks of the former affection. We do not doubt at all that mucous membranes suffer from the eczematous process.

The poorly nourished and strumous, especially among children, are peculiarly prone to eczema, often of the pustular type, presenting enlarged glands ciliary blepharitis, and otorrhea as complications.

Eczema is frequently seen after the eruptive fevers, especially measles, and postvaccinal eczema is occasionally encountered. As in grown persons, dietetic errors, with resulting gastro-intestinal derangements and the production of toxins, are responsible for many eczemas in infants.

We have seen rebellious eczemas in children yield readily to treatment after the removal of adenoid growths.

Any form of **external irritant** may set up an eczema, *e. g.*, chemicals, sugar, flour, lime, soap, hard water, rough underclothing. Thus, we find the disease in chemists, physicians, bricklayers, washerwomen, bar-tenders, and grocers. A varicose condition of the veins, often associated with flatfoot, is a common exciting cause.

Cold and excessive heat, especially when the latter causes free sweating, may be added to this list of excitants; also seborrhea, and the irritation produced primarily or secondarily by microorganisms.

Diagnosis.—If the chief features of eczema, as given above, be borne in mind, the difficulties of diagnosis are as a rule not very great; but the following diseases may, under certain circumstances, have a sufficiently close resemblance to it to warrant a degree of circumspection in coming to a conclusion, especially in ill-defined examples of the respective affections. These disorders are: Scabies, lichen planus, erysipelas, dermatitis herpetiformis, psoriasis, herpes, urticaria, pemphigus, acne rosacea, and certain forms of syphilis.

Treatment.—To the physician acquainted with the manifold conditions, general and local, that may directly or indirectly be concerned in the production of the inflammation of the skin that is called eczema, it is clear that a successful treatment is based upon something more than a hasty and unconsidered prescription. On the contrary, the patient's constitutional peculiarities, his habits, occupation, and present physical condition should be carefully enquired into before prescribing internal remedies, if, indeed, such medication is needed at all, and the location, type, and stage of the eruption should be minutely noted before ordering local applications.

The old question whether it is safe to cure an eczema rapidly, especially in children and old people, has again been revived in late years by a few writers. We think, however, that the vast majority of practitioners are fully agreed that there is no danger in curing an eczema as quickly as possible, as an abundant experience has shown that not only no harm follows, but that the patient's well-being is greatly promoted by removing a constant source of general and local irritation.

The eczematous patient should endeavor to avoid, as far as possible, all sources of external or internal irritation. Among the more usual external irritating agencies may be mentioned various chemical substances: lime, sugar, flour, dust, the pressure of ill-fitting or rough garments, and hard water and bad soap. Persons who perspire freely in hot weather, or as a result of too vigorous exercise, should always keep the skin well powdered. Alcoholic drinks and overindulgence in tea, coffee, and tobacco should be avoided, as also such fermentable food as oatmeal, pies, pastries, etc. We are quite in agreement with White and Hutchinson in the belief that eczema is often provoked or aggravated by acid fruits.

In spite of Hall's¹ very interesting investigations in the etiology of infantile eczema, in which he rejects the idea of

¹ Brit. Jour. Dermatology, July-August, 1905.

digestive disturbance as a factor in its production, offering instead the theory of external irritation, we are still of the opinion that a suitable dietary is of great importance. The common habit of stuffing with unwholesome food should be forbidden, and the medical attendant will find it wise to write out carefully prepared diet lists suitable to the age of the patient. If the child is being suckled, equal care should be taken with the mother's diet, and she should be required to abstain from indigestible and overstimulating food and drink; and if the nursing mother is weak and ill-nourished she should be put on appropriate treatment.

From a consideration of the etiology of eczema it must be obvious that we possess no specifics for the disease. The internal treatment is chiefly symptomatic, that is, we endeavor as far as possible to remove presumable existing causes and apparent complications. Very often indeed the eczematous patient is seemingly in the enjoyment of good health, and the exciting cause has disappeared, or the disease has been brought into existence by purely local influences. Under such circumstances, it is not incumbent upon the physician to invent a morbid condition in order to prescribe for it.

The habit of indiscriminate purgation, so common formerly, is far from judicious, but a mercurial purge followed by a saline is very serviceable in acute eczema, and also, repeated occasionally, in the more chronic attacks of the overfed and gouty. Habitual constipation and the various forms of gastric and intestinal dyspepsia should receive appropriate treatment. Startin's well-known *mistura ferri acida* is of undoubted value in the constipation of anemic women, especially young women with menstrual irregularities:

R—	Magnesii sulphatis	ʒj
	Ferri sulphatis	gr. iv
	Acidi sulphurici diluti	ʒij
	Sodii chloridi	ʒss
	Infus. gentianæ q. s. ad	ʒiv—M.

S.—Tablespoonful in goblet of cold water one hour before breakfast.

From one-half to one teaspoonful of Carlsbad salts, or one-half teaspoonful of bicarbonate of sodium, in a large goblet of very hot water one hour before breakfast, is a good routine practice in persons with constipation and impaired digestion.

The syrup of rhubarb, with or without magnesia, is an excellent aperient for children. Small doses of calomel, gr. $\frac{1}{20}$ to $\frac{1}{10}$ several times a day, or in nightly doses for a considerable time, are valuable in infantile eczema. The syrup of the iodide of iron, or Parrish's chemical food, should be given to delicate children. Cod-liver oil is serviceable in pustular eczemas at any age; it is also to be prescribed for persons showing tuberculous tendencies.

We have found the following formula very satisfactory:

R—Ol. morrhuae	3iv
Pancreatini saccharati	3j
Pulv. acaciae	q. s.
Glyceriti hypophosphitis, Syr. lactophosphatis, Aque	aa 3iv
Olei gaultheriae	gtt. xxx—M.

S.—Tablespoonful three times a day for adults.

There now remain to be considered, briefly, certain drugs that are often prescribed for their presumed direct effect upon the eczema itself, or as combating some symptom of the affection. Both in and out of the profession arsenic has long enjoyed a reputation as in some sort a specific; yet, as a matter of fact, it is rarely employed by dermatologists. Arsenic should never be ordered in acute eczema, and its efficacy in any type of the disease is more than doubtful. However, if there are no particular contra-indications to its use it may be tried in dry, scaly forms, in affections of the nails, and in so-called neurotic eczema. Arsenic should always be given directly after meals, well diluted, and in small doses. Fowler's solution, the preferable form, may be combined with wine of iron, some of the peptonated iron preparations, or with manganese.

R.—Vini ferri ʒjss
 Syrupi simplicis,
 Liq. potassii arsenitis aa ʒij
 Aquæ destillatæ ʒij—M.
 S.—Teaspoonful in water after meals. Wilson.

Of late years Mr. Morris has reintroduced the use of antimony in acute eczema. If the patient is in good health, depression and great arterial tension being contraindications, he begins by giving 10 to 13 minims of the wine, repeating the dose in an hour and, if necessary, two hours later. The interval between the doses is gradually increased, while the amount is diminished, until a dose of 7 minims is reached; this latter quantity is then given three times in the twenty-four hours as long as the acute symptoms last.¹ Alkaline diuretics are of advantage when the urinary secretion is scant or loaded and the skin generally inactive. Bulkley advises the following prescription:

R.—Potassii acetatis ʒiv- ʒjss
 Tr. nucis vomicæ ʒij
 Infus. quassie q. s. ad ʒiv—M.
 S.—Teaspoonful in water after meals.

In intractable cases, with frequent relapses, Crocker has found the application of counter-irritants, mustard leaves or a small blister, over the vasomotor centres of the parts very beneficial. If the disease affects the upper half of the body, revulsives may be applied to the nape of the neck; if the lower half, they may be put on over the lumbar enlargement.

In most cases of localized eczema it is generally possible to allay pruritus by properly selected topical agents; but when the disease is extensive the relief of the intolerable itching is a matter of the greatest difficulty. In acute conditions absolute bodily and mental rest should be enforced, and in suitable cases the antimonial wine should be ordered and the patient put on the customary fever diet. In more chronic cases, or in less acute types of the

¹ We think these doses are too large, and believe that it would be safer to begin with 5 or 6 minims.

disease, when such means may fail, we shall be forced to try other agents. Opium is generally inadmissible, on account of its increasing cutaneous irritability, and should be prescribed only as a last resort. Phenacetin, chloral, sulphonal, or some similar drug should be tried first. Quinine in tolerably large doses often acts well. Pye-Smith recommends quinine as particularly efficacious in infantile eczema; $\frac{1}{2}$ gr. for a child of one year, one-half hour before bedtime; 1 gr. for two years, and as much as 5 gr. at the age of fifteen. Pilocarpine by the mouth or hypodermically is worth trying, but it must be given cautiously. Tincture of belladonna and the extract of cannabis indica sometimes act well. The elixir of the valerianate of ammonium is helpful in nervous patients.

The chloride of calcium is another old remedy in eczema that has again been revived, especially as of value in the annoying pruritus. The dose advised is 20 gr., largely diluted with water, after meals. We have seen it do much good.

The **local treatment** of eczema is of the greatest importance. In quite a large proportion of cases internal remedies are not demanded at all, either because the disease has been evoked by purely local agencies or because the internal exciting cause has ceased to be operative, and there remain only the effects, which must be got rid of by topical means. Although there is a vast array of preparations for application in eczema, all more or less useful when judiciously employed, there are after all two vital underlying principles that should never be ignored. These are *rest* and *stimulation*. Their application will depend upon the stage in which the eczema happens to be. By rest is meant something more than the usual surgical significance of the word; it means, in the sense in which we use it, freedom from all sources of possible irritation—for example, not only immobilization of a part, but exclusion of air, the discontinuance of the irritating effects of soap and water, the use of fixed dressings and, most important of all, relief of pruritus, so that the patient is not constantly tempted to disturb the affected

surface by scratching. On the other hand, in cases of a more chronic character, when the skin is greatly infiltrated, the object of treatment is to cause resorption of effused material by stimulating remedies, or sometimes, indeed, by using very active local stimulants to induce an acute and more manageable affection in place of a chronic and intractable one.

In order, however, to determine more accurately the pathological state of the skin, and to prepare it properly for the reception of the appropriate remedy, it is an absolute essential that the parts be freed from scales, crusts, and other secondary products. For the removal of crusts, repeated soakings in a bland oil are much preferable to poultices. Occasionally it is allowable to use a strong detergative soap, such as Bage's olive soap, but as a general thing the rule never to wash an eczema is to be respected. So soon as the stage of the disease has been determined, whether acute, subacute or chronic, and all the other features of the case have been fully considered, such, for example, as the age of the patient, the length of time the eczema has existed, and also the seat of the complaint, the question will then arise as to what form of local treatment will prove of the most service. The proper answer to this question often makes the difference between success and failure. We shall, therefore, now describe somewhat in detail the various topical preparations that are used in eczema, specifying the conditions to which they are applicable, and after doing this the clinical features and special therapeutics of eczema as it affects the various regions of the body will receive attention.

Lotions.—According to circumstances lotions may be soothing, drying, and astringent, or stimulating. They are of especial service in the acute vesicular form of the disease, and also in erythematous and papular eczema. They should not be used on hairy regions nor where there is a free discharge. As a rule, in case of an acute inflammation, the lotion is to be kept constantly applied, renewing it as often as necessary to prevent its becoming dry; under

other conditions it serves its purpose best by being mopped on occasionally and allowed to dry. Among the soothing and somewhat astringent lotions, useful in the acute stage, may be mentioned the following:

R—Tr. opii,
 Liq. plumbi subacetat. ss ʒij
 Aquæ ʒiv—M.

The following is recommended by Taylor:

R—Liq. plumbi subacetat. ʒij
 Tr. opii ʒij
 Tr. camphoræ ʒj
 Glycerini ʒij—M.

S.—To be mixed with one quart of water and applied on lint.

Dr. White recommends the black wash of full strength or dilute in the acute stage. He suggests that it be mopped on for ten to fifteen minutes at a time, and that this should be followed by an application of zinc salve put on with the finger.

Jamieson suggests this modification:

R—Lotionis nigræ,
 Liquoris calcis ss ʒiv
 Mucilaginis tragacanthæ ʒj—M.

The preparation having, however, the widest range of application is the well-known Startin's lotion, also known as the compound oxide-of-zinc lotion:¹

R—Zinci oxidi ʒss
 Pulv. calaminæ præp. ʒiv
 Glycerini ʒj-ij
 Liquoris calcis ʒvi—M.

S.—Shake.

Distilled or rose water may be used in place of the lime-water.

If a drying effect only is desired, it may be mopped on gently with a soft rag or mopped or painted on by means of a brush. Otherwise cheese-cloth cut in strips may be dipped into it and bound on the parts with a roller bandage. Carbolic acid to the amount of 5 to 10 minims may be added

¹ The latter name will be used in the pages that follow.

to each ounce to increase the antipruritic effect. The itching may still further be allayed by the addition of menthol:

R—Acidi carbolici	℥xx-xl
Mentholis	℥ij
Alcoholis	q. s.
Lotionis zinci oxidi comp.	℥iv-viiij—M.

This should be mopped on as needed. Boeck speaks highly of this preparation: talc and starch, of each 50; glycerin, 20; lead-water, 100. This is diluted with twice the volume of water, and then applied with a mop or brush. In case of a very sensitive skin, one-half of the lead-water may be replaced by a 1 per cent. boric acid solution.¹

Carbolic acid lotions are of great value in eczema, particularly as adjuvants to other treatment:

R—Acidi carbolici	℥ij
Glycerini	℥ss
Alcoholis	q. s. ad ℥viiij—M.

Such a lotion may be used to advantage in connection with a salve; thus the muslin bearing the ointment may be lifted up and the lotion mopped on when itching is present. Menthol can be added to this lotion. Bulkley suggests weak solutions of permanganate of potassium as an antipruritic. A drying lotion much in vogue among English physicians is composed of nitrate of silver, 16 gr., and sweet spirits of nitre, 1 oz.

In the management of chronic, more or less thickened patches, stimulating lotions may be found useful. One such, warmly recommended by Hutchinson, is as follows:

R—Liq. plumbi subacetatis	℥x
Liq. carbonis detergentis	℥j
Aquæ destillatæ	q. s. ad ℥j—M.

S.—Mop on affected parts twice daily.

Bulkley esteems highly a preparation called liquor picis alkalinus:

R—Picis liquidæ	℥ij
Potass. causticæ	℥j
Aquæ	℥v—M.

¹ Monats. f. prakt. Derm., August 1, 1895.

This may be used diluted (1 to 4 drachms to 1 pt. of water) as an antipruritic; or rubbed full strength into localized patches. Duhring has brought forward a compound tincture of coal-tar made thus: a strong tincture of quillaia bark is made by adding 1 part of the bark to 4 of 95 per cent. alcohol. One part of coal-tar is digested with 6 parts of this tincture, with frequent agitation, for not less than eight days. It is to be used in the proportion of 3 to 15 minims to 1 oz. of water, to which may be added a few minims of glycerin.

Another very valuable stimulating lotion is the spiritus saponatus kalinus, made of 2 parts of green soap and 1 of alcohol. This is to be rubbed well into the affected part, which should then be washed, thoroughly dried, and then covered with diachylon ointment spread on strips of muslin.

Tar may be added in this manner:

R—Picis liquidæ,
Saponis olivæ præp.,¹
Alcoholis 3ij—M.

Many other lotions are of value containing salicylic acid, alum, sulphate of zinc, thymol, grindelia robusta, etc.; also strong solutions of caustic potash, but salicylic acid has, today, largely superseded this latter agent.

Powders.—These preparations have not a very wide range of usefulness as regards the treatment of eczema. They are indicated in the acute generalized erythematous variety and in some subacute conditions where there is little or no secretion. They may prove of value in certain cases where lotions or salves are not well borne. They may be dusted on with a powder puff or absorbent cotton, or put into long quilted bags for permanent application to the part.

Anderson's antipruritic powder is well known:

R—Pulv. amyli 3vj
Zinci oxidi 3jss
Pulv. camphoræ 3ss—M.

¹ Bagoë's soap, prepared under this name, is superior to the imported green soap.

Hebra has suggested the following:

R—Zinci oxidi,
 Pulv. aluminis plumosi,
 Pulv. rad. iridis flor. aa 3j
 Pulv. amyli 3ij—M.

We have found this powder excellent in eczema intertrigo:

R—Thymolis gr. j
 Pulv. zinci oleatis 3j—M.

The stearate of zinc, fuller's earth, and emol keelet may give good results. The latter is said to possess the property of rendering hard water soft.

Liniments.—These will be found useful when large surfaces are affected, particularly if the parts are red and moist. The old-fashioned carron oil, with, perhaps, the addition of 1 per cent. carbolic acid, makes a soothing application. Olive oil or oil of sweet almonds may be substituted for the linseed oil. Crocker's calamine and zinc liniment is rather more astringent:

R—Pulv. calaminæ præp. 3ij
 Zinci oxidi 3ss
 Olei olivæ,
 Liq. calcis aa 3j—M.

Skinner proposes the following formula:

R—Calaminæ pur. 3j
 Zinci oxidi gr. xv
 Liq. calcis 3ss
 Olei amygdalæ dulcis q. s. ad 3j—M.

Mix the powders with the oil, then add the lime-water gradually.

Ointments.—Most cases of eczema as seen in practice are best treated by ointments. They are especially indicated when there is exudation and crusting; although they are of great service in scaly and infiltrated eczemas. In order that the best results be obtained, the salve should be perfectly fresh and thoroughly prepared, and to this end the physician should direct his patients to a druggist in whom he has perfect confidence. It is a good rule, in most cases, to begin with a soothing preparation, feeling one's way, so to speak, even though the case appear to be one requir-

ing stimulation. Soothing ointments should usually be spread on strips of muslin and neatly bound on the parts: a failure to observe this principle will result in many therapeutic failures. If stimulation is required the remedy may be rubbed in with the fingers. If a mere protection of the surface is sought, the unguentum aquæ rosæ serves an excellent purpose. It is also an excellent ointment base. If a more astringent and antipruritic effect is desired, the following formula is admirable:

R—Bismuthi subnitratis	℥ss
Acidi carbolici	m v-x
Ung. aq. rosæ	℥j—M.

A very useful application in many conditions is the benzoated oxide-of-zinc preparation of Wilson. 1 drachm of the dilute solution of the subacetate of lead may be added to increase its sedative action, and the same quantity of the tincture of camphor may be incorporated for itching, if this is a prominent symptom.

Jamieson's¹ ophthalmic ointment is a very soothing application for eczematous eyelids:

R—Olei amygdalæ dulcis,	
Aquæ	āā ℥ss
Lanolini	℥iij—M.

To this may be added zinc oxide or bismuth.

Other formulæ are as follows:

R—Zinci carbonatis	℥j
Acidi salicylici	gr. x
Vaselini	℥j
Ung. aq. rosæ	℥j—M.
	Jamieson.

R—Bismuthi oxidi	℥jss
Acidi oleici	℥jss
Ceræ albæ	℥v
Vaselini	℥ij
Olei rosæ	m j—M.
	Anderson.

¹ Brit. Jour. Derm., May, 1897.

R—Glycerol. plumbi subacetatis (Squire) . . . 3j
 Ung. aq. rosæ 3j
 Ceræ albæ q. s.—M.

R—Bismuthi subnitratiss 3j
 Ung. aq. rosæ 3j—M.

An ointment of great value in so-called seborrheal eczema is as follows:

R—Acidi salicylici ʒj-3ss
 Sulphuris præcip. ʒj-3ij
 Vaselinei 3j
 Olei limonis q. s.—M.

Resorcin in the strength of from 1 to 20 per cent. may be substituted for the salicylic acid in the above. Lanolin combined with 20 per cent. of cold cream affords a tenacious and soothing unguent to the inflamed skin.

One of the most universally applicable and valuable ointments is the unguentum diachylon of Hebra, but as the original formula is very difficult to prepare, it is now usually made in the following manner:

R—Emplastri diachyli,
 Vaselinei aa 3j
 Olei lavandulæ (vel ol. geranii) q. s.—M.

Melt the lead plaster and vaselin together by gentle heat, stirring constantly. Then add the oil of lavender or geranium. If the lead plaster is fresh it is best to remove the irritating glycerin by a water bath. This preparation is now generally known as unguentum vaselini plumbicum. Various drugs may be added to this salve, as, for example, tar, phenol, boric acid, oxide of zinc, starch, etc. The application should be made as directed above, viz., on cloth. This latter point cannot be impressed too firmly upon the physician. A formula of great value, especially in infantile eczema, is the following:

R—Zinci oxidi 3j
 Pulv. amyli 3ij
 Ung. picis liq. 3j-3ij
 Ung. vaselini plumb. q. s. ad 3j—M.

S.—Spread on strips of lint or muslin.

Here only sufficient tar has been added to allay itching. The various preparations of tar are of great value in eczema, but it is an agent that cuts both ways. If a stimulating effect is desired the stronger preparations should be employed, thus:

R̄—Olei rusci ʒj-ʒij
 Ung. aq. rosæ ʒj—M.

Such a prescription is especially useful in the squamous forms of the disease, and in such cases it should be rubbed thoroughly into the skin two or three times in twenty-four hours.

As regards other medicaments that can be employed in the treatment of eczema in the form of salves, may be mentioned carbolic and salicylic acids, tannin, sulphur, acetanilid, and mercury.

The mercurials are of great value, but should be applied with caution for fear of absorption. Duhring speaks well of calomel in the strength of $\frac{1}{2}$ to 1 drachm to 1 oz. Niemeyer extolled the virtues of the white precipitate. We have got much satisfaction from it in the strength of from 20 to 60 gr. to 1 oz., or combined with tar:

R̄—Hydrarg. ammoniati ʒss
 Liq. picis alkalini ʒj
 Ung. aq. rosæ ʒj—M.

Pastes.—In recent years pastes have to a certain extent taken the place of salves in the treatment of eczema, especially where an ointment proves irritating. They are usually made with vaselin, to which is added a large quantity of an inert powder, with a small amount of the active ingredient. The resulting preparation, when smeared on the skin, quickly dries, leaving a protective coating. Pastes are better adapted for dry than for moist surfaces.

One of the best is, undoubtedly, that of Lassar:

R̄—Acidi salicylici gr. x
 Zinci oxidi,
 Pulv. amyli ʒā ʒij
 Vaselini ʒss—M.

G. H. Fox's is, perhaps, even better:

R—Acidi salicylici	gr. x
Pulv. amyli,	
Bismuthi subnitrat.	āā 3ij
Ung. aq. rosæ	q. s. ad 3j—M.

The writers suggest the addition of 5 per cent. oil of cade when more stimulation is needed.

Such pastes may be spread on muslin, or rubbed directly in if the condition be chronic and scaly. They are useful in eczema intertrigo. We have employed the following with excellent results:

R—Bismuthi subnitrat.	3iv
Zinci oxidi	3j
Pulv. amyli	3ij
Acidi carbolicæ	ṡv-xv
Vaselini (vel ung. aq. rosæ)	q. s. ad 3j—M.

Ihle's paste is made after the following manner:

R—Resorcini	gr. x-xx
Zinci oxidi,	
Pulv. amyli,	
Lanolini,	
Vaselini	āā 3ij—M.

The linimentum exsiccans of Pick is a very valuable preparation in erythematous and papular eczemas, unless there is much exudation and infiltration:

R—Tragacanthæ	gr. lxxv
Glycerini	ṡxxx
Aquæ destillatæ	3xxvss—M.

An excellent protective coating is obtained by adding 10 per cent. of oxide of zinc and 1 per cent. of carbolic acid to the above.

Dr. Elliot's bassorin paste is as follows:

R—Bassorin	3x
Dextrin	3vj
Glycerini	3ij
Aquæ destillatæ	q. s. ad 3xxvss—M.

Prepare cold.

It may be medicated as desired. When large surfaces are involved, Unna's oxide of zinc paste serves an admirable purpose:

R—Zinci oxidi 3j
 Mucilaginis acaciæ,
 Glycerini aa 3ij—M.

S.—Apply with a brush several times daily.

One per cent. carbolic acid may be added when itching is present. If the glycerin disagrees, oil of sweet almonds affords a less irritating menstruum.

Glycerin Jelly.—Some years since, Professor Pick, of Prague, suggested the employment of gelatin as a vehicle for various medicaments and as a protective coating. Such preparations are to be used in the same class of cases as the pastes. They are somewhat difficult of preparation. Unna and Beiersdorf combined the gelatin and glycerin directly and found, moreover, that a definite relation must exist between the amounts of gelatin, glycerin, and water taken and the percentage of drug employed. One of the best formulæ is as follows:

R—Gelatinæ 3iv
 Zinci oxidi 3ijss
 Glycerini 3j
 Aquæ destillatæ 3x—M.

Heat the water, dissolve the gelatin in it, then add the glycerin and zinc oxide and stir until cold. One-half per cent. of ichthyol may be added. The gelatin is prepared for use by melting in a hot-water bath; the liquefied material is then painted on. While moist cover the jelly with tissue paper. Jamieson praises this method of treatment enthusiastically. Gelanthum, a preparation introduced by Unna, has been slightly modified by Skinner:

R—Tragacanthæ 3ijss
 Gelatin. opt. 3ij
 Glycerini 3vj
 Thymolis gr. 4
 Aquæ destillatæ q. s.—M.

Place the tragacanth and gelatin each in 10 oz. of water in covered jars, and bring the final quantity up to

12 oz. with water. Other drugs, with the exception of acetate of lead, may be added as desired.

Plasters.—The germ of the idea of fixed dressings may, perhaps, be found in Hebra's method of spreading salves on strips of lint. Of late years many methods of making continuous applications, in eczema and other diseases of the skin, have been introduced, and among the most valuable are, doubtless, the various forms of plasters. The plaster and salve mulls of Unna possess great merit, and can now be obtained in this country. The chief difficulty is to get them in a fresh condition. The salve mulls are prepared by incorporating the desired remedy with a base made usually of benzoated suet and lard, and this is spread on one or both sides of undressed muslin. The plaster mulls are made of gutta-percha faced with some adhesive substance containing the medicament, and backed with muslin. The diachylon mull is of great value in subacute eczema. The salicylic acid plaster mull does excellent service in deeply infiltrated patches on the hands and feet. Of late years, however, these plaster mulls have been in a great measure replaced by Pick's salicylated soap plaster or some modification of it:

R—Emplast. saponis liq.	3ijss
Olei olivæ	3v
Acidi salicylici	gr. xxxvj—M.

Klotz's modification is thus prepared: Diachylon plaster, 60; soap plaster, 25; yellow wax, 2; vaselin, 8; salicylic acid, 5. For a 5 per cent. plaster no olive oil is required, the salicylic acid softening the mass sufficiently. Duhring's formula for a 20 per cent. plaster is: Lead plaster, 3j; yellow wax, gr. xlvij; salicylic acid, gr. cv.

The formula that we usually employ is as follows:

R—Emplast. plumbi	3xxv
Pulv. saponis	3iv
Aquæ dest.	q. s.
Vasellini	3v
Camphoræ	gr. xx
Acidi salicylici	3v—M.

S.—Spread on muslin.

Make a paste with the soap and water; add the lead plaster and evaporate to a proper consistency; then add the vaselin, salicylic acid, and camphor. Melt together with a gentle heat. The percentage of salicylic acid may be increased as necessary, and the plaster diluted by adding unguentum vaselini plumbicum. These plasters may be left *in situ* for several days if agreeable to the patient. They are especially useful in infiltrated eczemas.

Paints.—Similar in object and in action to the other fixed dressings are the pigments made with collodion and traumaticine. Various medicaments may be introduced into these liquids. In small, infiltrated patches of eczema, salicylic acid and chrysarobin, of each 5 to 10 per cent., are valuable.

The following is often useful in eczemas about the mouths of children:

R—Olei cadini 3j
 Collodii (vel traumaticini) 3j—M.
 S.—Apply with a camel's-hair pencil.

It should be borne in mind that in adding an oil to collodion the contractile variety should be prescribed, since the addition of an oil to the flexible preparation will render it too flexible.

Piffard holds that contractile collodion will at times abort a threatened eczema, or, if painted around the margin of an existing lesion, tend to prevent its extension.

Acetic cantharidal collodion is often useful as a blistering agent in small chronic patches of eczema.

Tar, as an ethereal and alcoholic tincture, may be advantageously employed as a paint, the region being afterward dusted over with an indifferent powder. Leistikow regards coal-tar as a better antipruritic than wood-tar. He advises it especially in dry eczema of the scalp, neck, and external genitals. Care should be observed lest poisoning occur.

R—Coal-tar 3jss
 Alcohol (95 per cent.) 3j
 Sulphuric ether 3ss—M.
 S.—Apply with a brush.

Baths.—It may be stated as a broad general rule, that water in any form is harmful in eczema. The less an eczematous surface is bathed the better for it, particularly in the acute forms. With the exception of occasional alkaline baths in generalized papular eczema, they are now but little prescribed. The general tonic effect of sea-bathing may sometimes benefit chronic localized patches, as may also the various mineral and thermal springs of this country, provided intelligent local treatment be carried out at the same time. At springs the copious drinking of the water, together with proper diet and hygiene, may often give gratifying results. For cleansing an eczematous surface, warm milk and water, or olive oil applied on cotton wool, serves better than water.

Massage, Scarification, and Mechanical Support.—

Massage is occasionally of value, and is indicated particularly in chronic, infiltrated forms of eczema; as a consequence of such stimulation of the absorbents the exudation is dissipated, the thickening decreases, and the pruritus is lessened. Multiple punctures and scarification may occasionally prove of benefit in very chronic patches of eczema. The rubber web bandage affords beneficial support and compression in suitable cases, particularly when applied to the leg.

Having now given a brief general outline of the various internal and local measures that are useful in the management of eczema, we shall next proceed to a description of the special forms of the disease:

Eczema of the Scalp.—In this region the disease may assume various elementary types, viz.: erythematous, vesicular, squamous and pustular, but the physician rarely encounters it in this stage, his advice being sought, as a rule, only when secondary changes have supervened. Thus, the case may present more or less widespread yellowish-green crusts, that sometimes cover the part like a cap; or the surface is moist, the hair glued together; or the eruption may be infiltrated, scaly, and intensely itchy. These various states may be present at one and the same

time, but it is more usual to find one or the other predominating, or else the sole form of eczema present. The erythematous variety may commence as such, or it may supervene upon the other forms. Pustular eczema of the scalp is most often seen in children, and extension to the face and ears is of frequent occurrence. It is further attended in most cases by postcervical adenopathy. These swollen glands rarely suppurate.

Seborrhea is, perhaps, the most common exciting cause of eczema of this region.

Treatment.—The internal treatment requires no special comment, beyond that in the pustular variety, particularly in children, cod-liver oil, iron, or other tonic measures are often demanded. In both children and adults the first step necessary is the removal of crusts, if present. This is done best by soaking in olive or cod-liver oil; poultices should be avoided. In children the hair may well be clipped, but this would be objectionable, for obvious reasons, in adults, especially women.

Stiff ointments should not be applied to hairy regions, preparations having vaselin, oil, alcohol, glycerin, or water as excipients being more suitable. The acute forms of eczema require soothing applications, and for this purpose may be employed oil of sweet almonds or sweet oil, containing 1 per cent. of carbolic acid, or a lotion of the black wash mopped on for a few minutes at a time, followed by a reapplication of the oil, or an ointment composed of bismuth (subnitrate), ℥j; vaselin, ℥j.

In young infants, or where the hair has been cut close, the unguentum vaselini plumbicum, spread on strips of muslin and held in place by a snugly fitting cap, affords a valuable dressing. The addition of 1 drachm of boric acid to 1 oz. is often beneficial. After the subsidence of the inflammatory symptoms, or in the subacute condition, we have derived the greatest satisfaction from the following:

R—Ung. picis liquidæ	3j-ij
Zinci oxidi	3j
Ung. aq. rosæ	3j—M.

S.—Spread on strips of cloth. Change twice daily.

In acute pustular eczema, Duhring recommends ichthyol, gr. x-xx; olive oil, 3j, and in the subacute, discharging form a salicylic acid salve of from 25 to 40 gr. to 1 oz. Calomel and white precipitate are valuable, in ointment form, if used cautiously over a limited area. The scalp bears tar remarkably well, and in most cases of a chronic type it may be applied in the form of an oil.

R—Olei rusci	3j
Olei amygdalæ	3j—M.

S.—Apply with dropper.

R—Olei rusci	3j
Glycerini	3j
Alcoholis	3vj
Olei rosæ	q. s.—M.

Somewhat more pleasant and, we believe, more efficacious in chronic, scaly eczema of the scalp, is this prescription:

R—Acidi salicylici	3j
Sulphuris præcip.	3j
Vaselini	3j
Olei limonis	q. s.—M.

S.—Work thoroughly into the scalp once or twice daily.

Resorcin in from 3 to 20 per cent. strength may be substituted for the salicylic acid.

In refractory cases an ointment as follows is often useful:

R—Acidi tannici	3j
Acidi carbolici	m ^v -x
Cerati Galeni	3j—M.

Or this:

R—Hydrarg. ammoniati	3j
Liq. carbonis deterg.	3j
Vaselini	3j—M.

In very obstinate, moist eczemas, Duhring and others advise a 1 to 2 per cent. silver nitrate solution, applied daily or less often and followed by a mild salve. In these

cases it will be necessary, now and then, to remove from the part the accumulation of salve, scales, etc. For this purpose in acute cases, as before stated, oils should be used. In more chronic conditions soap and water may be employed if caution is observed, but even then it should be as infrequently as possible.

Bagoe's green soap and alcohol, or cologne, equal parts, or from 3 to 6 teaspoonfuls of borax or carbonate of soda to 1 pt. of water may be used. Immediately after the washing, vaselin, oil, or the salve should be reapplied.

If the eczema is set up by the ravages of pediculi, they should, of course, be removed at once, together with their nits.

Eczema of the Face.—Any variety of eczema may occur on the face, the erythematous, however, being more common in adults, and the vesicular, papular, and pustular types in children. The erythematous form is prone to attack individuals past middle life and is an exceedingly stubborn affection and subject to relapses. It generally develops suddenly and at first may be mistaken for erysipelas. It usually involves the forehead, nose, cheeks, and eyelids, the latter often being completely closed from the attendant swelling. The skin is of a dusky-red color, edematous, and the itching and burning are very severe. In chronic types the skin becomes leathery, the lids are stiff with infiltration, deep fissures occupy the natural furrows and wrinkles of the skin, and the surface is covered with fine scales, except that here and there have been developed raw and oozing points due to scratching.

Oftentimes a certain amount of papular eczema is seen to accompany this form of the disease. Itching is well-nigh intolerable and occurs usually in paroxysms. In cases of long standing, ectropion may result from the infiltration of the lids.

In children the elementary forms are more often observed, but ordinarily the secondary results only are seen by the physician, viz., red, scaly, and slightly thickened patches, or red and exuding surfaces more or less

covered with crusts and scales, or, again, the underlying surface may be entirely covered with thick crusts. This form of the disease is often accompanied by a similar condition of the scalp and ears, and is then known in common parlance as "crustea lactea" or "milk crust." The itching is excessive, and in order to get relief the parts are remorselessly torn with the nails, so that the whole face at times is a mass of crusts made up of pus and blood with here and there deep excoriations. In young infants, that cannot use the hands, the face is rubbed against the pillow or nurse's shoulder.

Pustular eczema of the upper lip is not infrequent and the lip may be considerably tumefied and the nares partially occluded.

Treatment.—In acute erythematous eczema of the adult face, treatment should be of a soothing character, lotions being preferable:

R—Zinci oxidi	℥ss
Pulv. calaminæ præp.	℥iv
Glycerini	℥j
Liq. calcis	℥vij—M.

S.—Mop on or apply on cheese-cloth cut to fit the parts.

R—Zinci oxidi	℥ss
Mucilag. acaciæ	℥j
Emuls. amygdalæ	℥ij
Aquæ rosæ	q. s. ad ℥iv—M.

S.—Smear on gently every few hours.

If an ointment seems to suit better, the unguentum vaselini plumbicum serves a good purpose; or this:

R—Glycerol. plumbi subacetat (Squire)	℥ss
Ung. aq. rosæ	℥j
Ceræ albæ	q. s.—M.

It is well, in these acute cases, to secure a free action of the bowels, employing for this purpose the *mistura ferri acida*, or some similar prescription.

In cases of a less inflammatory type, with moderate infiltration, the zinc-ichthyol gelatin is valuable, or the zinc and tar salve may be cautiously tried. As many

patients are unwilling to wear ointments and lotions during the day, and in this lies the main difficulty in effecting a cure, the parts may be protected by Provan's paste:

R—Tragacanthæ,	
Glycerini	ss 3iv
Boracis	3ss
Aquæ destillatæ	q. s.—M.

This may be washed off at night. If preferred, powdered oleate of zinc may be dusted on.

When the disease is limited to the forehead, the diachylon salve mull may be constantly worn under the inner hat-band. This so-called "sweat band" is a prolific source of eczema, and in the interest of susceptible skins we are accustomed to order that a piece of soft cotton cloth be pasted over the part that comes in contact with the forehead.

In our experience, even in very chronic eczema of the face, frictions with green soaps and strong preparations of tar are ill-borne; but we find that the compound salicylic plaster (see under Plasters), neatly spread on muslin and adjusted to the parts, is of great value. We usually employ the 5 per cent. preparation.

Duhring suggests a formula for the same purpose:

R—Camphoræ	3ss
Empl. plumbi	3iij
Petrolati	3iij
Olei olivæ	3j—M.

In certain scaly, more or less well-defined patches seen on the cheeks and about the mouth, the following is valuable:

R—Hydrarg. ammoniati	ʒj
Liq. carbonis detergentis	ʒj
Lanolini	ʒj—M.

In children the crusts should be removed by inunctions with sweet oil, or by applying at once the unguentum vaselini plumbicum spread on muslin strips. This latter may then be continued as the remedial agent. As a routine prescription in almost all types of eczema in children, especially eczema rubrum, the following prescription,

which we have called the "compound starch ointment," has the widest range of usefulness:

R—Zinci oxidi	3j
Pulv. amyli	3ij
Ung. picis liq.	3ij
Ung. vaselini plumb.	q. s. ad 3j—M.

In warm weather the amount of starch may be increased. In place of the tar, 2 to 3 minims of carbolic acid may be added to each ounce; and instead of the oxide of zinc, an equivalent quantity of boric acid. In most cases, however, the formula as given is the best. The bismuth, zinc, and starch preparation as given above under Pastes is of value. For children the amount of carbolic acid should be decreased. As a rule, salves should be applied on strips of muslin and kept in place by a light skeleton mask. Lassar's paste used in this way, or lightly smeared on, in papular and scaly eczema, is a valuable remedy. It dries to a thin adhesive powder, which allays itching, and is not readily scratched off.¹

It is especially true of the eczema of children that the affected surface **must not be washed**, as thereby all the good accomplished by the remedy in days is sacrificed in a few minutes.

Eczema about the mouth is quite difficult to heal, particularly in children, owing to the free motions of the parts, the irritating effects of nasal discharges, saliva, the passage of food, etc. Here a fixed dressing is necessary and we are in the habit of employing the following pigment, after first removing the crusts:

R—Olei rusci	3ss-3j
Collodii (contractilis) vel traumaticini	3j—M.

The linimentum exsiccans or gelanthum, to which 10 per cent. of oxide of zinc has been added, makes a good application for this purpose, and is less irritating than the tar and collodion.

¹ Unless these pastes are well made they do more harm than good.

Eczema of the Ears.—The various forms of the disease are to be seen in this situation. Children are, perhaps, more often affected, especially in connection with eczema of the face or scalp; but it may easily occur in adults, when it is often on the ears alone, and is usually symmetrical. The otologist generally meets those cases of acute or chronic eczema that involve the external auditory meatus.

In the acute type the ears are red, swollen, and tender; in the chronic cases the parts are board-like, fissured, and scaling. Exacerbations and relapses are frequent. In eczema of the external meatus, the patient complains of deafness, pruritus, and a feeling of fulness. The canal becomes clogged with scales and cerumen.

Treatment.—In acute eczemas of the auricle soothing remedies are indicated, as, for example, the compound zinc lotion, or the oxide of zinc and almond emulsion. Ointments are more useful in subacute and chronic cases, the best, perhaps, being the modified diachylon, which should be applied on cloth. In very chronic cases, the 5 per cent. salicylic acid plaster will quickly reduce the infiltration. In those very persistent eczemas that occur behind the ears of children, a brisk application of green soap, followed by the unguentum vaselini plumbicum, is especially useful. For the itching, a carbolic acid lotion may be mopped on:

R—Acidi carbolici	ʒss
Glycerini	℥xv
Alcoholis	ʒj
Aq. rosæ	q. s. ad ʒiv—M.

Eczema of the Nares.—The disease in this situation is often associated with chronic nasal catarrh, and in children frequently follows in the wake of the exanthemata. It is to be distinguished from lupus and syphilis. The nose is often swollen and the nasal orifices almost closed with crusts. The nostrils may be infiltrated and cracked. The disorder may be confined, however, to the alæ. On removing the crusts, the Schneiderian membrane will be found reddened and congested with, at times, considerable

ulceration. The surface may show a discharge or be in a dry, glazed condition. A follicular eczema of the hair follicles within the nares is not uncommon in the adult, and is quite persistent and painful. Pustular eczema of the upper lip is a frequent accompaniment.

Treatment.—These cases require that the general health receive proper attention. Cod-liver oil and syrup of the iodide of iron are useful in children, and as the follicular eczema of adults usually indicates debility, it must be treated accordingly. Crusts should be first removed by inunctions with oil, and afterward soothing and slightly astringent ointments applied. For this latter purpose boric salve and weak ointments, 5 to 20 gr. to 1 oz., of white precipitate or calomel are suitable. Squire's glycerole of the subacetate of lead, 1 drachm to 1 oz. of cold cream, is soothing and healing. If the condition is distinctly pustular, the following preparation acts promptly.

R—Xeroformi	gr. xx-lx
Vasellini	3ij
Lanolini	3vj—M.

Unna suggests that small rolls of paper covered with zinc and red precipitate salve mull should be inserted into the nostrils.

Eczema of the Lips.—The vermilion surface of the lips is sometimes the seat of an exuding or squamous eczema, the latter being often accompanied by painful cracks and fissures. These are the more frequent varieties. As already stated, the cutaneous portion of the upper lip is often the seat of a pustular eczema and this is particularly obstinate if there is a mustache.

Treatment.—The treatment of the disease as seen on the vermilion border is highly unsatisfactory. Acute conditions should be soothed; thus, lanolin with 20 per cent. cold cream may be tried; or the following bismuth ointment:

R—Bismuthi subnit.	3ss
Aquæ	3j
Ol. amygdalæ dulcis	3j
Lanolini	3vj—M.

G. H. Fox recommends 5 gr. of thymol to 1 oz. of cold cream, especially in squamous conditions. The 5 per cent. salicylic acid plaster is also useful. Where there is much thickening, strong solutions of caustic potash, 20 gr. to 1 oz., may be employed; or nitrate of silver in stick or solution, particularly if there are deep cracks. Van Harlingen speaks well of the following:

R—Acidi phosphorici dil.,
 Glycerini,
 Syrupi aa 3ss—M.
 S.—Apply t. i. d.

Shoemaker's method of immobilizing the lips with adhesive plaster is an excellent one. The diachylon plaster mull may be used for the same purpose.

If silver nitrate has been employed, it is well to paint the parts afterward with compound tincture of benzoin. Painting with flexible collodion will often afford relief.

A careful investigation of the patient's general health will sometimes discover a clue as to the cause of this intractable affection, and its removal will result in the disappearance of the local disorder. It has been pointed out (Neisser) that certain tooth washes or pastes sometimes are responsible for the condition.

In pustular eczema of the upper lip, any nasal discharge that may be present should be checked as quickly as possible and, in the adult, the vibrissæ should be removed. The best local application in the acute stage is the unguentum vaselini plumbicum combined with 5 or 10 per cent. xeroform. In more chronic conditions a modified Rosenthal paste acts well:

R—Acidi tannici gr. lxxv
 Sulph. præcip. 3ijss
 Zinci oxidi,
 Pulv. amyli aa 3ij
 Vaselini 3ijss—M.
 S.—Smear on thinly twice a day.

If the infiltration is excessive it will be found necessary to exert pressure by means of a bandage, and to do this

effectually a thin wedge of cork should be worn between the lip and the teeth.

Eczema of the Lids.—This is a rather frequent form of eczema, especially in connection with the same affection occurring on the face generally. Eczema of the edges of the lids is especially frequent in strumous children and may be associated with a chronic conjunctivitis. Eczema tarsi is in the great majority of cases associated with a seborrhea of the scalp and probably owes its origin to that source. Many cases of styes have undoubtedly the same etiology. Moist eczema of these parts is by no means uncommon.

Treatment.—The most soothing applications are demanded for eczema of the general surface of the lids, even if there be considerable thickening. Equal parts of cold cream and zinc salve will be found agreeable. Jamieson's ophthalmic salve is useful:

R—Olei amygdalæ dulcis,
 Aquæ destillatæ āā ʒss
 Lanolini ʒiij—M.

Equal parts of cold cream and lanolin serve a good purpose. If the disease involves the edge of the lids, epilation of the lashes is often demanded, although the use of the following may render this procedure unnecessary:

R—Hydrarg. oxidi flav. gr. ij-viiij
 Vaselini ʒj—M.
 S.—Apply to edges of lids with a camel's-hair pencil.

The adjustment of proper glasses may do much good, as some ocular defect may be the origin of the trouble. Many of these cases of eczema tarsi come as sequels to the eruptive fevers, and demand tonic treatment.

In every case the condition of the scalp should be looked to, and if marked seborrhea is present it should be removed. The head should be shampooed at least once a week with the green soap preparation, the patient meanwhile rubbing in the following:

R—Acidi salicylici	℥j
Sulph. præcip.	℥ij
Vaselini	℥j—M.

S.—Apply once a day.

In strumous children cod-liver oil and iron are demanded.

Eczema of the Beard.—The symptoms of this form are similar to those observed in eczema of the scalp; any of the elementary lesions may be present. Most cases are, however, of the pustular type. The affection may involve limited regions only, or may extend to the entire beard, and even to the eyebrows and eyelashes. It is not necessarily confined to the hairy region, as it at times invades the neighboring glabrous skin, thus differing from sycosis, which it may resemble somewhat in other respects. Pustular eczema of the beard may be either acute or chronic. In the acute form the parts are hot, swollen, and tender, and upon the congested skin small pustules, which are seated between the hairs and at the follicle mouths, appear in great numbers. These soon rupture, the purulent discharge drying to yellowish or greenish crusts that mat the hairs together. In the chronic type, the hairs become somewhat thinned, and removal of the crusts shows a reddened, exuding surface, which is usually smooth, and not tuberculated as in sycosis. A squamous form at times follows in the wake of the other varieties and is apt to be obstinate. It usually occurs in circumscribed patches attended with much pruritus.

Treatment.—In the acute cases soothing treatment is indicated. The beard should be closely clipped and applications of salicylated or carbolized oil; olive oil and lime-water, equal parts; black wash, cold cream, etc., made to the affected region. Frequent shaving is imperative after the subacute stage has been reached, though the patient and the barber are apt to declare this impossible. However, it can and should be done every second day at least, and may be followed by an application of unguentum vaselini plumbicum on muslin. Such hairs as are situated in pustules should be epilated before shaving. If the

condition has become chronic, more active measures are demanded. The remedy that we have found most useful in this disease and also in coccogenic sycosis is Rosenthal's paste. (See formula under Pustular Eczema of the Lips.) Robinson's ointment is valuable:

R—Ung. diachylon,	
Ung. zinci oxidi	aa 3ss
Ung. hydrarg. ammon.	3iij
Bismuthi subnit.	3jss—M.

This also serves a good purpose:

R—Sulphuris præcip.	3j
Ung. aq. rosæ	3j—M.

Lassar's paste or the following may also be tried:

R—Hydrarg. ammoniati	3j
Liq. carbonis detergentis	3ss
Vaselini	3j—M.

Another tar preparation is as follows:

R—Olei rusci	3j
Ung. aq. rosæ	3j—M.

The tar preparations are particularly beneficial in squamous forms of eczema.

The disease is very prone to relapse, and the treatment should be kept up in a modified way long after it is apparently cured.

When the disease is well along toward recovery the salve may be kept on only at night, a dusting powder of oleate of zinc being applied during the day.

Eczema of the Breast and Nipple.—This form is most commonly met with in nursing women, although virgins and even males are not altogether exempt. In the mild type one or both nipples are attacked, presenting a superficial denudation of epithelium with slight discharge and crust formation if the parts are at rest. In more severe cases the nipple is raw, swollen, and deeply fissured; sometimes it is sunken below the surrounding areola, which latter is heavily crusted with the inspissated discharge. The eruption is usually in the form of a circle about the

nipple and may extend to involvement of the entire breast and perhaps to the trunk. Mastitis is not an infrequent sequela. Eczema intertrigo frequently attacks the under surfaces of the breasts in obese women.

Treatment.—For fissured nipples, Veiel recommends Lister's formula:

R—Acidi boracici,
Cereæ albæ aa gr. xv
Paraffin,
Olei amygdalæ aa 3ss—M

S.—Wash the nipple after nursing with borax water (1 to 25), then apply salve on muslin.

For the acute form of the disease the modified diachylon ointment, or Unna's paste, answers well:

R—Sacchari albi,
Zinci oxidi,
Mucilag. acaciæ,
Glycerini aa 3j—M.

S.—Apply after drying parts thoroughly.

Many procedures have been suggested, all testifying to the obstinate nature of the disease, thus, tinctures of myrrh and benzoin, the silver nitrate crayon, weak solutions of the same salt (16 gr. to 1 oz.), lead and rubber shields, etc., have each been highly praised. In non-nursing women, green soap friction followed by unguentum vaselini plumbicum is one of the best methods. Lassar's paste is valuable in eczema intertrigo. Liveing highly praises the silver nitrate solution. We prefer it made thus:

R—Argenti nitratis gr. xvj
Spiritus ætheris nitrosi 3j—M.

S.—Brush over affected surface.

Eczema of the Umbilicus.—In this location the disease generally assumes the form of an eczema rubrum, and is usually excited by seborrhea of the part. The navel is red and swollen, more or less crusted, with a rather offensive exudation. At times the neighboring skin is involved.

Treatment.—Eczema of the umbilicus is frequently quite resistant to treatment. Duhring suggests this formula:

R—Zinci oleatis	5j
Hydrarg. chloridi mitis	gr. xv-xxx
Vasellini	5j—M.

Boric salve used as in eczema of the nipple is also of value. Salicylic acid, sulphur, or weak preparations of resorcin, in ointment form, may be tried. It is well to apply the salve on lint and insert this into the navel.

Eczema of the Flexor Surfaces or the Joints.—Eczema in these localities is usually symmetrical and is apt to assume the appearance of an eczema intertrigo, though the skin may become much infiltrated, fissured, and covered with scales.

Treatment.—In the acute stage Lassar's paste or Fox's modification of it is very efficient. In the subacute conditions the tar and zinc salve may be employed to advantage:

R—Zinci oxidi	3j
Ung. picis liq.	3ij
Ung. aq. rosæ,	
Lanolini	aa 3iv—M.

Or, the compound salicylic plaster. If the disease has become chronic, frictions of green soap, followed by tar salve or the unguentum vasellini plumbicum, should be employed.

Eczema Intertrigo.—This occurs between the gluteal folds, in the axillæ and groins, under the breasts of women and, in fact, wherever two surfaces of skin come in close contact. It usually has its beginning in a simple erythema intertrigo that has gone untreated. In order to avoid this condition stout people especially should keep the parts freely dusted with some bland powder.

Treatment.—When the disease is once established, the affected surfaces should receive few ablutions and should be kept separated by a thin layer of lint.

Dusting powders are of advantage:

R—Thymolis	gr. j
Pulv. zinci oleatis	3j—M.
R—Pulv. sem. lycopodii	3ij
Zinci oxidi	3vj—M.

Lassar's paste is useful; and in certain cases a salve of boric acid (1 drachm to 1 oz.), or of salicylic acid (15 gr. to 1 oz.) may be tried.¹

Eczema of the Anus and Perineum.—The disease in this region is not often acute in character. The anus alone may be affected, or the perineum and scrotum may also be attacked. The mucocutaneous folds may be congested, slightly thickened, and with or without fissures. In most instances the discharge is free and very offensive. In more severe cases the parts are red, greatly thickened, exhibit painful cracks, and the eczema extends up to the anal mucosa and may actually involve it. One of the most painful manifestations is the implication of the raphé. The disease is accompanied by intolerable pruritus, which is usually worse at night, and pain is often severe as a result of the fissures and the rawness left from scratching.

The skin, in long-standing cases, may assume the appearance of "white parchment." Hemorrhoids, catarrhal inflammations, and prolapse of the rectum are frequent complications or etiological factors in this disease.

Treatment.—The internal treatment is very important. The diet should be regulated carefully, smoking forbidden, and a regular movement of the bowels maintained. For the latter purpose Bulkley recommends this formula:

R—Sulph. præcipitat.,
Potass. bitartrat. ʒj—M.

S.—1 to 2 drachms at night in water.

Compound liquorice powder is serviceable also. Any complicating rectal disorder should be removed and gouty and lithemic states, if present, should receive appropriate treatment. Bulkley's method of using hot water is of great value and nothing, probably, relieves so much the distressing pruritus. Before beginning the fomentations the following salve should be spread on a suitable piece of lint:

¹ See also under Erythema.

R—Zinci oxidi	3j
Pulv. amyli	3ij
Ung. picis liq.	3ij-iv
Ung. vaselini plumbici q. s. ad	3j—M.

The patient then sits upon a low chair, having a pan of very hot water between his feet. Into this he dips a soft cloth which is immediately withdrawn and pressed firmly against the affected region for the space of a minute. This process is repeated three times, when the parts should be quickly dried and the ointment applied immediately. The fomentations may be repeated on the following morning, if desired, but usually a reapplication of the ointment alone will suffice at that time.

Much relief is occasionally afforded by mild mercurial and carbolic salves. 1 drachm of calomel to 1 oz. of vaselin is often serviceable. Liveing praises the following:

R—Bismuthi nitratis	3ij
Morphin. hydrochlorat.	gr. ij
Ung. aq. rosæ	3j—M.

The nitrate of silver solution is valuable at times:

R—Argenti nitrat.	gr. xv
Spiritus ætheris nitrosi	3j—M.
S.—Paint on parts.	

Lassar's paste is a good application, as is also the following:

R—Acidi carbolic	ʒx-xv
Zinci oxidi	3j
Bismuthi subnit.	3ss
Pulveris amyli	3ij
Vaselini	3j—M.

Duhring recommends the following as worthy of trial:

R—Sulph. præcipitati	ʒij
Naphthol.	ʒj
Morphin. sulphatis	gr. ij
Zinci carbonatis	3j
Ung. aq. rosæ	3j—M.

The stronger remedies, as silver nitrate, potash, and coal-tar, should be reserved for cases showing much infil-

tration. Scarifications will cure some rebellious cases. (See treatment by *x-ray*.)

Eczema of the Genitals.—Eczema of the scrotum, of the erythematous and weeping forms, are fairly frequent, beginning as a rule insidiously and leading to leathery, infiltrated skin, with exaggeration of the natural furrows. There may be much swelling, and an offensive, gummy secretion is poured out in the moist variety. In the erythematous and squamous cases hard nodules may form which later suppurate and cause no little annoyance.

Eczema occurring on the penis is mostly erythematous in character and usually attacks that portion of the organ which is in contact with the scrotum, though the whole or any portion of it may be involved. In general involvement of the penis the whole member may be enormously increased both in length and breadth. A condition of elephantiasis may be brought about, as in a case under our care, necessitating the removal of the prepuce.

In women the labia majora are frequently the sites of a vesicular eczema that is attended by much swelling, and that rapidly becomes an eczema rubrum. However, any form of the malady may attack the female genitalia, and the eruption may extend to the clitoris, nymphæ, or into the vagina. In these cases the parts are raw, swollen, and moist, with intolerable itching.

In either sex the eruption may be limited to the genitals or may spread to the mons veneris, abdomen, or thighs. In all obstinate eczemas of these parts the urine should be examined for sugar, and the possibility of the presence of pediculi be borne in mind. In women a leucorrhœal discharge or some less apparent pathological condition of the genital tract may be responsible for the trouble.

Treatment.—In acute eczema of the penis and scrotum, soothing measures, as the calamine and zinc lotion, or the oxide-of-zinc emulsion with almond oil, should be used. Eczema of the prepuce responds, as a rule, to Lassar's paste. The subacute forms involving the scrotum or labia do well under the tar and zinc salve; and, if the itch-

ing be intense, Bulkley's hot-water method is of great value. The unguentum vaselini plumbicum alone may do much to better the condition. These various dressings are to be held in place by a suitable suspensory in men, and in case of women by a T-bandage.

In the chronic infiltrated type, occurring on the scrotum, stimulation is demanded. A good method is to rub the part with a solution of salicylic acid in alcohol (1 drachm to 4 oz.), and afterward apply the unguentum vaselini plumbicum, with 1 drachm of boric acid to 1 oz. Green soap frictions followed by the same salve oftentimes does much good in rebellious cases. The compound 5 per cent. salicylic acid plaster spread on muslin and bound to the scrotum may be recommended. Wilkinson's salve may be mentioned:

R—	Olei cadini,		
	Sulph. sublimat.	. . . . .	ss 3iv
	Saponis viridis,		
	Adipis	. . . . .	ss 3j
	Crætæ præp.	. . . . .	3ijss—M.

Silver nitrate or caustic potash, 10 to 20 gr. to 1 oz., used as a paint, is sometimes efficacious, as also is tincture of iodine, or Vleminckx's solution, pure or dilute. These latter are to be rubbed in. Veiel recommends a tar-diachylon salve (1 to 20) that may be increased gradually to 1 to 2. The same general method is to be pursued in case of chronic vulvar eczema, although the preparations should be reduced considerably in strength.

Eczema of the Hands and Feet.—Eczema of the hands and feet is quite common. The hands are more frequently involved, though all four members may be affected at the same time. The disease is usually symmetrical. The greater frequency on the hands is doubtless due to their more frequent exposure to various irritants. The dorsal surfaces of the hands and feet may be attacked by any form of the disease, particularly papular, squamous, and moist varieties; and eczema intertrigo is not uncommon between the fingers and toes. Acute vesicular eczema is comparatively frequent, especially on the hand, the whole

member being covered with a multitude of minute vesicles. On the palmar surface, owing to the thick epidermis, the vesicles do not burst readily and they may burrow for a considerable distance.

All degrees of the dry, squamous eczema, aptly called *eczema rimosum*, may be found on the palms and soles. At times the condition is merely one of excessive dryness with moderate infiltration; again there are well-defined fissured and thickened patches occupying the centre of the hand; or, perhaps, they may be more pronounced over the thenar and hypothenar eminences. In more severe cases the whole surface may be involved even to the extent of seriously interfering with the use of the members. The same condition may be found limited to the tips of the fingers. Pruritus is usually not marked in dry eczemas of the palms and soles and may be altogether absent.

In these cases, owing to the anatomical arrangement of the parts, and to the inelasticity of the infiltrated skin, cracks and fissures soon form, which prove very painful. In addition to the squamous eczema of the soles, any form of the disease may occur on the dorsi. Papular and erythematous eczema is common on the instep and ankles, and is very annoying.

Treatment.—Nothing succeeds so well in acute vesicular eczema of the hands as the familiar calamine and zinc lotion. It should be applied on cheese-cloth strips and renewed frequently; 5 to 10 minims of carbolic acid may be added to 1 oz. When the acute stage has passed away, the following salve should be applied:

R—Ung. picis liq.	. . . . .	3ij
Zinci oxidi	. . . . .	3j
Ung. aq. rosæ	. . . . .	3vj—M.

Eczema of the backs of the hands and feet must be treated according to the character of the lesions and the stage at which the disease has arrived. Subacute papular and vesicopapular conditions are benefited by the following:

R—Bismuthi subnit.	3iv
Zinci oxidi	3j
Pulv. amyli	3ij
Acidi carbolici	℥x-xv
Vasellini	3j—M.

Ointments of white precipitate (20 to 30 gr. to 1 oz.) or of tar and zinc, and Lassar's paste, may be found useful in certain cases. Eczema rubrum often requires green soap frictions, followed by the unguentum vaselini plumbicum. The condition between the toes and fingers may be treated by the lead ointment, with 1 or 2 per cent. carbolic acid or in some cases by a powder:

R—Thymolis	gr. j
Pulv. zinci oleatis	3j—M.

A thick paste like Lassar's or Ihlé's or paintings with silver nitrate (16 gr. to 1 oz.) may occasionally be demanded.

If there is great thickening it must be got rid of, and this is, perhaps, best accomplished by means of Unna's salicylic acid plaster mull (15 to 20 per cent.), or a salicylic collodion ($\frac{1}{2}$ drachm to 1 oz.). Duhring's compound salicylic acid plaster (10 per cent.) will probably do as well (see above). The plaster is to be spread on muslin and held in place by bandages or gloves. Occasionally it may be necessary to blister with cantharidal collodion or to rub in a solution of caustic potash. The preparation known as "Emol'Keleet," a natural product similar to fuller's earth, has marked softening properties. It may be used in the following formula:

R—Emol keleet	3j
Zinci oxidi	3j
Glycerinæ plumbi subacetatis, B. P.	q. s.
Lanolini,	
Vasellini	ss 3ss—M.

S.—Apply at night and cover the hands with lint.

Use sufficient glycerin of the subacetate of lead to convert the powders into a paste; then mix with the vaselin and lanolin. After the thickened epidermis has been removed, rub into the patches twice a day the following:

R—Ol. rusci 3j
 Ung. aq. rosæ 3j—M.

Eczema of the feet in its manifold expressions should be treated upon the same general principles. In all forms of eczema of these members, or of the hands, freedom of the parts from irritating influences is a very essential part of the treatment. If the calling of the individual is responsible for the condition, it may be necessary for him to give it up, at least for a time.

In many cases, however, it is impossible for the patient to relinquish his work, and under these circumstances the physician may direct him to follow the method recommended by Unna.¹

At night the patient should wash his hands first with oil and then with soap and water; afterward the hands are dressed with strips of cotton cloth which have been spread with oil or some suitable ointment. In the morning this is removed with *dry* wool, and the parts are rubbed with the salve stick, which is a mixture of wax and lanolin and not easily saponified by alkalies. Walker's formula for the salve stick is cocoa butter, 2 parts; wax, 1 part; lanolin, $\frac{1}{2}$ part. This salve stick may be rubbed over the hands several times a day. After work the hands should be cleaned with oily wool, washing with soap and water being limited to once a day. The modified diachylon ointment (unguentum vaselini plumbicum) is perhaps the best salve for the application at night, and the soap known as "Emol Keleet," when procurable, is the blandest of articles. The x-ray is a valuable method of treatment in infiltrated patches (vide infra).

Eczema of the Nails.—Eczema may attack the nails without being present in other situations, but as a rule the hands or feet are also affected. The nail is rough and uneven, and lacks its normal luster. It is usually quite brittle and breaks readily. The skin around the base and sides may become thickened, red, and itchy. The nails

¹ Quoted by Norman Walker.

often show striations and furrows, and hypertrophy of the subungual portion of the epidermis may lift the nail up from its bed for a considerable distance.

Arsenic given over long periods in moderate doses is of undoubted value in these cases. The various combinations of salicylic acid, tar, and mercury, may be tried locally. Shoemaker recommends an ointment of tin oleate. For the removal of hyperkeratotic subungual tissue, a salicylic acid paste, or, as suggested by Hebra, its destruction with the Paquelin cautery, may be employed. Salicylic acid collodion may be painted on the infiltrated integument around the borders of the affected nail. Applications of the x -ray often produce surprising results.

Eczema of the Legs.—The disease in this situation is of rare occurrence in children, adults being much more frequently affected, especially those who are obliged to spend a large portion of the time on their feet.

Any of the types may be encountered here, the most striking and common form being eczema rubrum. When fully developed, this latter constitutes a picture not easily forgotten.

The disease may develop in single patches that remain separate, or they may coalesce to form a large sheet that may cover the anterior surface or indeed the entire leg. Its extent is usually limited by the knee above and the ankle below, but it may, at times, overstep either boundary, going a variable distance in either direction. When first seen by the physician the disease is usually chronic, and if it has not been treated presents a deep-red, raw, and exuding skin, with here and there evidences of scratching. Scattered over the surface are variously sized yellowish, brownish, or blackish crusts. Sometimes the legs are purplish red, tense, and shining, with no trace of scales or crusts. Varicose veins and ulcers are the usual accompaniments of this disease, and are undoubted etiological factors in these cases. Infiltration, exudation, and severe itching are prominent symptoms, and there is frequently, in the varicose condition, much pain of a deep, boring char-

acter. Various hypertrophic changes follow in the wake of long-continued eczema of the legs. Marked and enduring pigmentation is usual after healing.

Treatment.—If the case should be seen in the acute stage White's plan of mopping on black wash every few hours, followed by zinc ointment or cold cream with zinc, is a good method.

In classical eczema rubrum of the leg, nothing gives such excellent results as Hebra's green soap frictions followed by unguentum vaselini plumbicum.

The following directions should be closely followed:

In the first place, before beginning the soaping, the lead salve should be evenly spread on strips of muslin and put aside in a convenient place; the next step is to dip a piece of flannel into lukewarm water, and, having wrung it nearly dry, to smear on it a piece of the green soap of the size of a hickory nut. The soap should now be firmly rubbed into the affected parts for a few minutes, and when this has been accomplished, the flannel should be dipped into the water again, and while still wet briskly rubbed over the surface once more. As soon as this process has been concluded, the lather should be washed off, the skin gently dried, and the prepared muslin evenly and neatly applied, and the dressing kept in place with a roller bandage. According to circumstances, the soap frictions may last from five to twenty minutes, and be repeated once or twice a day. After the first rubbings the skin will look very angry, but after a time the itching diminishes, the infiltration disappears, and the surface gradually assumes its normal appearance.

In other cases, especially when the exudation and crusting is moderate, the glycerin jelly is a good application (see formula on page 115); or this formula of Morrow's may be tried: Add 250 parts of glycerin to 1000 of gelatin and 2000 of water, and with this combine 10 per cent. of zinc oxide and 1 per cent. of carbolic acid. Duhring and Van Harlingen speak well of Squire's glycerole of the subacetate of lead in the strength of 15 to 30 gr. to

1 oz. of glycerin. Strips of linen are soaked in this, and after application to the legs are covered with waxed paper and bandaged. Unna's paste is also useful:

R—Kaolini,
 Ol. lini āā 3vj
 Zinci oxidi,
 Liq. plumbi subacetatis āā 3ss—M.
 S.—Apply with a brush and then bandage.

The elastic web bandage is a valuable adjunct when there are varicose vessels or ulcers. It is greatly superior to the elastic stocking, as pressure can be varied at will and can at all times be kept uniform. The stockings soon stretch and become worthless. The bandage should in no case be applied directly to the skin. On the contrary, the local application of whatever sort, should first be applied; if a salve, on strips of muslin. A light muslin or gauze bandage is thrown over this and then a long, white cotton stocking is drawn on. The elastic bandage is finally placed over all, care being taken to obtain an equable pressure. It is a good plan to keep the parts of the leg not covered by salve well dredged with a dusting powder. Such a bandage should be applied always before getting out of bed in the morning and removed only after assuming the horizontal position at night. As a prophylactic measure the bandage should be worn even after the skin has healed. Pick, Klotz, and Duhring speak highly of the various salicylated soap plasters and they are doubtless often of benefit, though we think they are best adapted to the scaly and hypertrophic conditions.

Universal Eczema.—The disease rarely covers the whole body, there being usually more or less uninvolved skin. Any type of the disease may become universal, or several types may coexist. A form of diffuse eczema that is fairly common in elderly people consists of an eruption of closely set papules about the forehead, cheeks, back of the neck, arms, and thighs. The papules run together, forming infiltrated, scaling, and fissured patches that are intolerably itchy.

Treatment.—Patients suffering from universal eczema, especially the aged, should be put to bed and kept as quiet as possible. Such constitutional treatment should be undertaken as the case would seem to warrant. In the dry forms of the disease, powders and lotions serve best. The former should contain usually a little camphor or carbolic acid. If the eczema is moist and the symptoms acute, the common carron oil, to which has been added 1 minim of creosote to 1 oz., is a very soothing application, or a liniment containing oxide of zinc and calamine. The following cream suggested by McIntosh is good:

R—Bismuthi subnitrat.	3ij
Zinci oxidi	3ss
Glycerini	3jss
Acidi carbolici	ʒxx-xxx
Vaselini	3vj—M.

S.—Apply with a brush.

For universal application the amount of carbolic acid may be decreased or it may be omitted altogether.

The papular form mentioned above is particularly obstinate. Relief from the itching may be secured by the free use of carbolic acid in lotion or in spray form.

The following serves a good purpose:

R—Mentholis	3ij
Alcoholis	q. s.
Acidi carbolici	3ss
Lotionis zinci oxidi comp.	3vj—M.

Infiltrated patches may be treated by painting on this pigment:

R—Acidi salicylici	gr. xxiv
Chrysarobini	gr. xxiv
Traumaticini	3j—M.

Wilkinson's ointment (see above) or lotions of sulphate of zinc (4 drachms to 1 pt.), grindelia robusta (2 drachms to 8 oz.), and the following are also useful:

R—Liquor carbonis detergentis,	
Liquor plumbi subacetatis	ss 3ij
Aquæ destillatæ	3vij—M.

Eczema Infantile.—Most works on dermatology devote considerable space to a special consideration of eczema as it occurs in infancy and childhood, but as the disease varies but little in its clinical expressions at any age, and as we have endeavored to point out such divergences as do exist in the foregoing sections, we shall content ourselves with making a few practical statements. In the first place as regards prophylaxis. Many mothers in their eagerness to remove the sebaceous secretions from the scalps of young children use harsh measures, such as combing, scrubbing, etc., for the purpose, with the result very frequently of setting up an eczema that may extend down on the face and prove very rebellious to treatment. This condition generally rights itself; or in obstinate cases disappearance of the unsightly secretion may be expedited by inunctions with sweet oil or vaselin.

In the second place, more particularly, it is true, in dispensary practice, very young infants are allowed to eat everything that is going, and, besides, to drink tea, coffee, and beer. This, of course, must be stopped, and the child put upon food suitable to its age. The irritation of teething undoubtedly has an effect in evoking an eczema, as indeed do other irritants and irritating agencies, but the comfortable assurance often given by physicians, that the eczema will surely disappear when dentition has been completed, is not borne out by experience. Fox and others call attention to the fact that an adherent prepuce is often responsible for eczemas in children, by reflex irritation. The great lesson to learn in all eczemas, and in eczema at all ages, is that when the disease goes untreated it not only does not tend to get well, but that something closely akin to an infectious process exists, and that a localized patch may at any time be the focus from which an extension of the disorder may be expected. Infants and children should be bathed with bland soaps. The excretions in very young children should receive special attention, and apposed surfaces should be kept dry and well powdered. It is probably a fact that spoon-fed infants are more susceptible

of eczema than those nursed by their mothers, since they are prone to indigestions, but it must be remembered that this is only one of many possible causes of the affection. There is no special internal treatment for infantile eczema, that is, from the standpoint of the dermatologist. We may say, in a general way, that iron and cod-liver oil are very valuable in suitable cases. The local treatment we have already sufficiently outlined. We may here repeat the caution that eczema, especially, and above all infantile eczema, must not be washed.

The X-ray and Other Methods.—The x -rays may be advised, by way of exception, in certain rebellious chronic patches.

Hahn and Albers-Schönberg base the following conclusions on the treatment of 14 cases:

“In a weeping eczema the exudation disappears after one to four exposures, and does not return.

“In pruriginous eczema the itching often ceases after a single application.

“In dry eczema the effect of the rays is most marked.”

These opinions are confirmed by the experiences of Scholtz and of Freund.

We have been successful with this agent in certain cases of localized infiltrated eczema in which no other treatment had any effect. The itching is generally relieved after a few sittings.

The x -rays, according to Stelwagon, occasionally act admirably in thickened palmar cases, and are sometimes serviceable in eczema ani. They are especially useful in eczema of the nails.

The same authority advises **galvanism** in localized dense infiltrations which resist absorption, applying the negative electrode with 5 to 20 ma. In the same cases he sometimes uses **the static spark**, or **high-frequency current**. The latter is especially useful in subacute and chronic forms for the relief of itching. Allen recommends it especially in lesions about the anus and genitals.

Phototherapy has sometimes done well in cases of the same sort.

Prognosis.—The prognosis of eczema, as regards the cure of the existing eruption, is generally good. Like all other catarrhal affections, the disease is apt to relapse whenever the exciting cause or causes come into operation. It is, therefore, essential, in making a prognosis either as to the duration of a present manifestation of the disorder, or the possibilities of a relapse, to take very fully into consideration the actual condition of the patient at the time, and also his constitutional tendencies. The stage of the disease and its location must also necessarily enter into the forecast. An acute eczema, if promptly and properly treated, is manageable enough, but if allowed to become chronic, with the consequent more or less profound tissue changes, the difficulty of securing relief will be greater. For anatomical reasons, an eczema on the hands or feet is not easy to manage, especially if, in addition to the difficulty of keeping the parts at rest, the patient should follow a calling, such as that of a bricklayer, washerwoman, etc., where the exciting cause is always in operation. Then, in some situations, such as on the face, the subject of the disease is not always willing to apply the prescribed remedies during the day, thereby losing much time, and in reality undoing in one-half of the twenty-four hours what had been accomplished in the other. One must also take into consideration the age, habits, and social condition of the eczematous patient. In our experience, eczema is more curable in the young than in the old, in people of temperate habits than in those who indulge in excesses of any sort, and, as in all other diseases, the ability of the patient to obtain proper food, good hygienic surroundings, etc., must, as a matter of course, influence the progress of the disease.

ADDITIONAL PRESCRIPTIONS.

R—Sodii hyposulphitis	3iv
Glycerini	3iv
Tr. cardamomi co.	q. s. ad 3vj—M.

S.—Two teaspoonfuls in water three times a day after meals as a laxative.

Hartzell.

- R—Lenigallol 3j-ij
 Zinci oxidi,
 Amyli āā 3ss
 Petrolati 3j—M.
- R—Empyroformi,
 Zinci oxidi āā gr. xxv-l
 Vaselini,
 Lanolini āā 3iv—M.
 Weisz.
- R—Zinci oxidi 3vj
 Lanolini 3ij
 Olei olivæ 3j
 Liq. calcis 3j—M.
- S.—A soothing cream in acute eczema. Morris.
- R—Sulphuris præcip. gr. xl
 Naphthol gr. xx
 Morphine acetat. gr. ij
 Zinci carbonatis 3j
 Ung. aq. rosæ 3j—M.
- S.—Apply twice daily. In eczema. Duhring.
- R—Mentholi gr. v
 Acidi salicylici gr. x
 Pulv. amyli,
 Zinci oxidi āā 3ij
 Vaselini 3j—M.
- S.—Apply twice daily. In eczema of face. Brown.
- R—Ichthyolis gr. xxx
 Pulv. amyli,
 Zinci oxidi āā 3ij
 Vaselini 3iv—M.
- S.—Apply twice daily. In eczema barbæ. Brown.
- R—Tumenoli-ammon. 3ij-3j
 Zinci oxidi,
 Bismuth. subnit. āā 3ij
 Ung. simplicis,
 Ung. aq. rosæ āā 3ij—M.
- S.—In acute eczema.
- R—Hydrarg. chlor. mitis 3ss
 Ung. picis liquidæ,
 Ung. zinci oxidi āā 3ss—M.
- S.—In scaly eczema of the hands.

ULCER VARICOSUS.

Description.—This form of ulcer begins in middle life on the anterior aspect of the leg in multiparæ and laboring men afflicted with varicose veins. It is rarely seen among the well-to-do, but appears as an important item in the reports of city out-clinics and hospitals. It owns a threefold causation: the varicose condition with much standing and continued muscular exertion retarding the return of the blood stream from the lower extremities and thus lowering the nutrition of the tissues; frequently a general lowering of resistance from insufficient or improper food, alcoholism, arteriosclerosis, renal or cardiac incompetence, etc., and, lastly, an infected traumatism as its starting point. This may be a nail-scratch occasioned by the pruritic eczema which so often precedes and accompanies these ulcers, or one of the slight injuries to which the shin region is so subject. Usually beginning on the lower half of the anterior aspect, it extends vertically and laterally, in bad cases encroaching far around on each side, but rarely meeting behind. Veins may be opened and dangerous hemorrhage sometimes occurs. These lesions are often extremely painful and, as a rule, refractory to treatment, occurring as they do in subjects in whom the hygienic desiderata, with proper rest, cleanliness, and feeding, cannot be realized.

Treatment.—The advent in a clinic of another case of leg ulcer rarely excites much enthusiasm, so that these lesions generally receive perfunctory and routine attention, occasionally varied with spasmodic trials of some new method. Treatment, in order to be successful, should methodically take up the various indications presented in each particular case.

These indications are:

1. To rectify as far as possible existing morbid general conditions.
2. To assist the local circulation.
3. To subdue inflammation.

4. To relieve pain.
5. To cleanse the surface and sterilize it as much as may be.
6. To stimulate granulations.
7. To promote new epithelial formation and cicatrization.

1. *General Treatment.*—This includes the treatment of diathetic conditions such as malaria, gout, alcoholism, anemia, or scurvy, and an attempt at the management, at least, of tuberculosis, heart disease, hepatic or renal cirrhosis, arteriosclerosis, diabetes, etc. Many cases require more and better food and rest, all of which can generally be secured by a few weeks' stay in hospital. Most cases will be benefited by such agents as iron, arsenic, cod-liver oil, the hypophosphites, etc., and a few by alcohol in medicinal doses. Arbour Stevens advises 15 gr. doses of calcium chloride, three times a day, in foul-smelling cases, and later 2-gr. doses of calcium iodide, under which, he says, the ulcers heal with marvellous rapidity.

2. *Improvement of the Local Circulation.*—The best method of meeting this indication is one unfortunately not available in the majority of cases, namely, prolonged rest in bed. Its benefits are greatly enhanced by elevating the extremity. We have seen deep ulcers which had nearly surrounded the leg, successfully treated at the St. Louis City institutions by swinging them in a Hodgen splint. It is doubtful, however, whether the healing of such cases is worth the while, as they invariably break down again soon after the individual returns to his former mode of life. Amputation is probably the best solution of the problem in such cases.

Next in point of efficiency is a well-applied bandage extending from the toes to the knee. This may be of muslin, but better of flannel. The Martin rubber bandage is objectionable on account of its imperviousness. It is rarely tolerated in hot weather. Far better is the elastic web bandage applied over a long, thin stocking, as described in the article on eczema of the legs. Volkmann improved

upon the usual methods of support by fitting a thick layer of cotton into and over the ulcer. This is firmly bandaged on and left in place until the odor becomes foul. Lister modified this by covering the ulcer with a dry antiseptic dressing after sterilizing the surface. Strapping is a well-known and reliable procedure. Strips of adhesive plaster from one-half to one inch wide and long enough to extend three-quarters of the way around the leg are applied smoothly and evenly, so as to overlap about one-third their width. They should begin one inch or more below the ulcer and extend as much above it. Strips of metal have been applied over thickened edges so as to exert pressure. Unna's glycerin-gelatin is designed to afford support by compression and protection. It consists of glycerin and water, 10 parts each; zinc oxide and gelatin, 4 parts each. The leg being cleaned, the mixture is warmed in a water bath until fluid, and then painted on. Over this is applied a gauze bandage, and then another layer of the paint. This may remain in place for weeks, a window being cut over the ulcer if discharge is abundant.

The varicose veins above the ulcer may require ligation or excision. These measures sometimes relieve the superficial stasis by diverting the blood current into deeper vessels.

In some cases the blood supply, so far from being excessive, is deficient, owing to the fact that the base and borders of the ulcer are firmly bound down by dense cicatricial tissue. Various operations have been devised to meet this condition. Liston "starred" the ulcer by a number of radiating incisions through the base and edges. Harbordt practised deep cross-hatching; Nussbaum made a circular incision through the normal skin around the ulcer; Hodgen, instead of a single incision, made a series of short, overlapping cuts surrounding the lesion.

3. *Subduing Inflammation.*—When the surrounding tissues are acutely inflamed, as is so often the case when the patient is first seen, we must resort to cooling and sedative, moist applications, with elevation of the member and rest.

Thiersch's solution (boric acid, 5 parts; salicylic acid, 1 part; water, 500 parts) is probably equal to any.

4. *To Relieve Pain.*—Orthoform is useful in 20 per cent. ointment. Cocaine or morphine in 2 per cent. ointment will often be demanded. Rest and elevation of the part are the best methods at our command.

5. *Cleaning and Sterilizing the Surface.*—A number of substances and methods have been employed for this purpose. Among solutions those of mercuric chloride 1 to 1000 and carbolic acid 2 per cent. are well and favorably known. Hydrogen peroxide solution, formalin 1 per cent., and chloral hydrate 1 per cent. are efficient. Zeimer employs chlorinated lime 1 per cent., which he says not only dries up secretion, but gives the granulations a healthy appearance and usually brings about perfect skin formation. Waughop's plan of packing the ulcer with gauze soaked in a saturated solution of potassium permanganate is probably efficient, but unnecessarily cruel.

Among powders the iodine preparations are much used, iodoform still retaining the preference in spite of the many less odorous contestants for its position. We should remember that in a relatively large proportion of individuals it will excite severe dermatitis and sometimes grave general toxic symptoms. It is none the less too valuable to be wholly laid aside. Blum and Baerwald found a serviceable preparation in bismuth loretinate, an astringent and antiseptic iodine compound. Naphthalin is highly recommended. Ferments such as yeast, papoid, caroid, and protonuclein often do well.

Among other agents, the silver stick is an old acquaintance. Von Langsdorf scrubs the ulcer and leg with soft soap and covers the former with a paste of calomel. Over this he puts common salt and dresses with gauze and absorbent cotton, after which the application is removed and the surface washed. The method is very painful. Simonelli applies 50 parts of common salt and 5 of menthol. Sabouraud, in stubborn cases, rubs the surface with the silver stick and then with a zinc rod, freshly scraped so as

to expose a shining surface; acid zinc nitrate is formed, causing much pain. The ulcer is afterward dressed with ferrous sulphate as described a little below. Cataphoresis combined with electrolysis is used by Edwards, a zinc or zinc mercury positive electrode being applied to the surface. Stoker employed oxygen, and later ozone; an india-rubber bag with two large openings embraces the limb above and below the lesion. The gas is admitted into the chamber so formed, which is refilled every five or six hours. River uses chlorine gas. KClO_3 and HCl are put in a stoppered jar. A disk of white paper separates the chemicals from some absorbent wool, which when saturated with the gas, is placed over the ulcer, quickly covered with gutta-percha tissue, and bound on. Tarabrin brings the paquelin cautery to a dull red and moves it about at a distance of 5 or 6 cm. from the surface.

6. *Stimulating Granulations*.—Several of the methods enumerated in the last division of the subject are useful here also, notably the use of the iodine compounds; among others aristol, nosophen, iodol, and xeroform may be mentioned. The bismuth salts are useful, especially the subgallate, known as dermatol, as well as salol and antipyrine, salicylic acid, sulphur, camphor, ichthyol, balsam of Peru, myrrh, and benzoin. Any of the above may be used pure or in ointments. Among solutions we have those of potassium permanganate, zinc or copper sulphate, and silver nitrate. We have witnessed marvellous improvement from a single application of the preparation of ox-blood known as bovine. Sabouraud finds ferrous carbonate an excellent agent, especially useful in old, deep ulcers. The entire cavity should be filled with the powder, over which wadding and a bandage are applied. As an ointment it may be used in vaselin 1 to 40. Hamilton's method of sponge grafting hastens the filling of the ulcer.

The x-rays have found favor with some practitioners. Mackie uses the high-frequency spark. Marquant obtained striking results with the brush discharge from the positive pole of a static machine used twice a week.

7. *To Promote Cicatrization.*—Many of the agents above mentioned are also useful here. The occasional light touching of the granulations just within the healthy border with the silver stick is a favorite procedure. Redundant granulations may be pared off, treated by pressure, or bored through with caustic. Ointments of a bland or mildly stimulating nature are useful at this stage. Skin grafting finds an especial application here in hastening the closing over of large areas and securing a good skin surface. (For a full exposition of methods see article on Skin Grafting in Part II.)

ECZEMA SEBORRHOICUM.

Description.—According to Unna, the point of departure for nearly all cases of seborrheal eczema is the scalp, less often the margin of the eyelids, the axillæ, or the cruro-scrotal fold.

It may remain localized on the scalp for years, or spread to contiguous parts, such as the ears, forehead, temple, and neck. The sternal, interscapular, and umbilical regions are also favorite sites. Sometimes the disease may be observed on parts of the body distant from the scalp, as the legs, for example, the intervening skin being unaffected; or, again, the whole body may be invaded (pityriasis rubra seborrhoica).

On the scalp the vertex is the usual seat of the disorder, although the whole hairy region may be involved. There is often present more or less profuse branny scaling of a slate-gray color, the skin being pale and dry (pityriasis capitis). In the course of time the hairs become dry and lusterless, and after months or years a certain amount of baldness results (alopecia pityrodes).

The scaling, however, may be much increased, so as to cause thick, adherent masses that surround the hairs and ensheath them; or the scales may be softer and friable; or the scalp is covered with soft, yellow crusts, and the hair

becomes oily and shiny. Beyond slight itching, the subjective symptoms are not marked. Here and there over the scalp a generalized or patchy redness may develop, or reddish-yellow, sharply limited, round or oval, crusted or moist lesions may appear, sometimes extending to the temporal and parietal regions and even to the ears and parts of the face. Along the border of the hair of the forehead and neck, it is not unusual to see a red band covered with scales or crusts (*corona seborrhoica*). The eyebrows, beard, and mustache may be involved in varying degrees. Along the margin of the lids the disease is frequent and its association with "chronic dandruff" we have often pointed out to ophthalmologists. We have every reason to believe, moreover, that many styes have the same etiology, and that the best way to stop the styes is to treat the scalp.

The region of the trunk is frequently affected, particularly the sternum and the interscapular space. Here the lesions are to be found in circles or segments of circles, which by peripheral enlargement and subsequent coalescence in time present circinate figures. The disease in these situations corresponds to the *seborrhea corporis* of Duhring and so-called *lichen circumscriptus*. In the axillæ and groins sharply defined, reddish patches, with a tendency to advance in circinate outlines, and not uncommonly exuding, are of frequent occurrence.

Certain types of seborrheal eczema are also encountered that bear a close resemblance to psoriasis, but differ from it in leaving the elbows and knees free, and in the fact that the lesions are covered with fatty scales. This is the *seborrhea psoriasiforme* of authors.

Etiology.—Among the presumed external causes of seborrheal eczema should be mentioned irritation of all sorts, and probably direct contagion. We quite agree with Stelwagon in believing that among general causes digestive disturbances often act as predisposing influences, at least. There is no doubt that seborrheal eczema is of parasitic origin.

Prognosis.—The prognosis is usually good, but relapses may be expected.

Treatment.—The **internal** treatment, when demanded, is that of eczema, with special attention to the digestive organs. We believe that most excellent results are obtained with cod-liver oil (see eczema) in the persistent seborrheal eczemas of children, especially in cases where there exists involvement of the scalp, eyebrows, and eyelashes. In many of these cases the local affection apparently follows in the wake of the eruptive fevers, and local treatment alone is of only temporary benefit.

Locally, the care of the scalp is very important, since it is a matter of clinical experience that the disease may spread thence to other parts of the body.

As a shampoo in the pityriasic form of the disease, there is nothing better than equal parts of green soap and cologne, mentioned in connection with alopecia pityrodes (*q. v.*), where also the treatment of seborrhea of the scalp will be more fully considered.

Sulphur, resorcin, and salicylic acid are the most useful drugs in the local management. Elliott states that lotions are more beneficial on hairy parts than salves, and recommends one containing resorcin, 3 to 10 per cent., in equal parts of alcohol and water. Brayton suggests a lotion of salicylic acid and resorcin in the same proportions of alcohol and water. Norman Walker gives the following prescription:

R—Acidi salicylici	3j-iv
Olei ricini	3ij-vj
Olei rosæ geran.	ʒx
Alcoholis	q. s. ad 3vj—M.

The various lotions are best applied to the scalp by means of a medicine dropper, thus allowing the medicament to be placed directly on the scalp.

It has always seemed to us that in the dry, scaly forms of seborrhea, wherever situated, an ointment gives better results:

R—Resorcini	gr. x
Sulphuris præcipitati	3j
Vasellini	3j—M.

R—Acidi salicylici	℥j
Sulphuris præcipitati	℥j-ij
Vaselini	℥j
Olei limonis	q. s.—M.

The acute forms require the usual treatment prescribed in similar cases of eczema. On the hairy scalp a soothing lotion of equal parts of oil of sweet almonds and lime-water, with $\frac{1}{2}$ to 1 per cent. of carbolic acid, should be applied until the acute symptoms abate. Intertriginous forms may be satisfactorily treated by Lassar's or Ihle's pastes. (See Eczema.) When chronic, infiltrated eruptions are encountered, stronger remedies will be demanded, such as chrysarobin, pyrogallol, the tars, etc., as in psoriasis. In the psoriasiform type, with dry, scaling patches, so often found at the borders of the scalp, white precipitate and tar sometimes succeed where other remedies fail.

R—Hydrargyri ammoniati	℥j
Liq. carbonis detergentis	℥j
Vaselini	℥j—M.

Lesions have been removed by moderate doses of the x-rays. The fact, however, has little practical interest, as the method is not to be advised in a disease for which we possess surer, safer, and simpler agents of cure. Stelwagon, however, suggests the method in obstinate facial cases.

ADDITIONAL PRESCRIPTIONS.

R—Acidi salicylici	gr. x
Sulphuris præcipitati	gr. x
Zinci oxidi	℥ij
Vaselini	q. s. ad ℥j—M.
	Walker.
R—Sulphuris præcipitati	gr. xxx-xl
Acidi salicylici	gr. x
Pulv. amyli,	
Zinci oxidi	℥ss
Petrolati	℥iv—M.
S.—For use on non-hairy parts.	Stelwagon.
R—Sulphuris præcipitati	℥ij
Balsami Peruviani	℥x
Vaselini	℥j—M.]

R—Sulphuris præcipitati	gr. xx
Olei cadini	3ijss
Lanolini	3v
Vaselini	3j—M
	Sabouraud.

DERMATITIS REPENS.

Description.—Under this name Crocker was the first to describe a form of wandering dermatitis, following upon some local injury. It usually begins on one of the upper extremities, probably on account of the greater frequency of exposure of these parts. The initial point of departure may have been produced by the most diverse agencies, *e. g.*, a burn, a splinter, etc. The advancing border is sharply limited and irregular in outline, while the peripheral extension of the disease is marked by continuous undermining of the epidermis with a serous or purulent exudation, or in the form of vesicles or small blebs. The lesions may exceptionally be papular. While creeping forward at one point, it may heal at another, but the tendency is toward a continuous advance, often involving a considerable surface.

Where the process has passed over a given region the skin has a glistening, red and somewhat thin appearance. Crocker regards the disorder as a peripheral neuritis starting in some, perhaps trifling, injury, and kept up by a secondary parasitic infection.

Under the name of *acrodermatitis perstans* Hallopeau and others describe a very similar condition, which also has its beginning on the extremities—usually one finger—and by gradual development of fresh lesions involves other fingers, the nails, and parts of the hands. The first lesions are vesicles and pustules. Associated with the local expressions of the disease other parts of the body may exhibit secondary eruptions of an erythematous squamous type.

Treatment.—No internal treatment has been found beneficial, but locally antiseptics, *e. g.*, permanganate of

potassium in 10 per cent. solution, have been found serviceable, also salicylic acid, iodoform, and aristol. We have seen a 10 per cent. ointment of xeroform stop the progress of the disease. Hyde and Montgomery have obtained good results from a saturated solution of sodium hypsulphite, and from a strong white precipitate salve.

PRURIGO.

Description.—Prurigo is a chronic inflammatory disease of the skin that develops first in childhood, and is characterized by an eruption of pale, discrete papules, attended by severe itching. The disease, a very rare one in America, begins in infancy and makes its first appearance in the form of urticarial wheals, which are after a season followed by the papular eruption.

The papules are mostly of the size of hemp seeds, and at first are of the color of the skin, and more easily felt than seen, but in the course of time, as a result of the violent itching, which is the chief symptom, they become darker, more appreciable to the eye, and capped with blood or serum crusts. The extensor surfaces of the limbs are most involved, while the flexor aspects, the face and scalp, palms, soles, penis and scrotum are rarely, if at all, attacked.

According to the intensity of the accompanying pruritus, which will depend upon the extent and distribution of the prurigo nodules, the secondary changes of the skin will be more or less pronounced, viz., infiltration, pigmentation, desquamation, the deepening of the normal integumentary furrows, etc. In the so-called prurigo ferox there is an exaggeration of all these symptoms.

Treatment.—Since so little is known of the essential etiology of prurigo, internal treatment is mainly directed to improving the nutrition of the patient and securing proper hygienic conditions of life. Cod-liver oil is often of benefit. Certain internal remedies have been given for the relief of the tormenting pruritus, such as carbolic acid,

the bromides, pilocarpine hypodermically, and the tincture of *cannabis indica*.

A great variety of **local** measures have been advocated, such as warm and cool baths, sulphur, mercurial, alkaline and tar baths, and the application of lotions and ointments of sulphur, tar, and naphthol. The preparations of tar and sulphur may be used in conjunction with baths, and sometimes in bad cases better results are obtained by rubbing the parts with green soap, followed by the bath and the subsequent application of the selected salve.

Pick claims satisfactory results with the glycerin gelatin. In the mild cases seen in this country, lotions of menthol and carbolic acid give at least temporary relief from the itching.

The X-rays.—Belot obtained an apparent cure in a case of Hebra's prurigo by a single irradiation to each region. The itching was relieved within forty-eight hours.

PSORIASIS.

Description.—Psoriasis is a chronic, inflammatory disease of the skin, characterized by variously sized lesions having red bases, covered with white, mother-of-pearl scales, and affecting by preference the extensor surfaces of the body.

The disorder in its earliest expression consists of minute reddish spots or points of congestion which, practically from the beginning, may be said to show evidence of the characteristic free scaling. The eruption is usually made up of multiple lesions, and these by peripheral extension grow to the diameter of large or small coins. Having attained a certain definite size, the papules may remain discrete; in other instances the lesions coalesce and form in this way patches of variable sizes and shapes, generally with a tendency to a circular arrangement.

But whatever forms or dimensions the lesions of psoriasis may assume, if studied in detail it will be seen that they

have certain definite and determinate features that are rarely absent. They are infiltrated, elevated, sharply defined, have red bases, and are covered with white, imbricated, often easily detachable scales, which upon removal will exhibit a punctate, bleeding surface. According to Bulkley, after the scales have been thoroughly removed, a thin pellicle may be peeled off the surface of the patch. The scaling in psoriasis presents considerable variations. It is most abundant in the active stage of the disease, being scantier in the beginning and in the period of decline, and it is said that the scales are thinner in females than in males; and, moreover, under all circumstances, the thicker the epidermis the more plentiful the scales.

The patches of psoriasis, unlike those of eczema, are sharply defined against the unaffected skin, and the larger lesions are surrounded by a delicate red areola, the scale formation not keeping pace with the extension of the psoriatic process. In the further evolutions of the plaques the skin becomes considerably infiltrated, which condition in some situations gives rise to painful cracks and fissures.

The involution of the patches begins in the centre, and often in this way various bizarre figures are produced, the disease spreading at the periphery, and merging into adjacent lesions.

The lesions upon their disappearance leave no permanent traces behind, but upon the legs a considerable discoloration may persist for a season.

The eruption is at all times absolutely dry—there is no discharge feature. Itching is often entirely absent, but we have occasionally seen it very severe. In fact, aside from the bodily disfigurement, the patient is rarely made conscious of his affliction.¹

Psoriasis affects by preference the extensor surfaces of the body, and more particularly the elbows and knees. In

¹ Some French authorities (Besnier, Bourdillon) declare that if a great number of cases of psoriasis are carefully studied, it will be found that affections of the joints are present in a certain proportion of them—according to Besnier five times in a hundred.

our experience the scalp is usually involved, and most patients with psoriasis will tell you that they have had "dandruff" for a long time.

The disease may attack any part of the body, and is almost invariably symmetrical. In outbreaks of any extent the trunk always suffers, but less rarely the face, and more rarely still the palms, soles, penis, and scrotum.

The finger and toe nails usually suffer by extension of the disease from the hands and fingers, or the feet. The nails may be alone attacked. They become rough, thick, quite brittle, and streaked by longitudinal and transverse ridges, and, as in lichen ruber, may become lifted up and project away from the nail bed.

Psoriasis on the scalp rarely leads to even temporary loss of hair. In this region it may occur in bands and streaks or as discrete patches. According to Greenough psoriasis of the hairy scalp shows more or less epithelial scales, but not the redness common in other situations. The extension of the process from the scalp to the forehead, in the shape of a band running along the border of the hair, is very characteristic.

Psoriasis, while very constant in its eruptive features, exhibits great variety as to the course and extent of the disease as a whole. It is essentially a chronic malady, although a given outbreak may have an acute aspect. Frequent relapse is the rule; sometimes one or more attacks occur in the course of a year, or, again, a considerably longer period may elapse. In some cases the patient is never entirely free from the eruption. The amount of surface involved also varies much. The eruption may be absolutely universal, or limited to a few insignificant papules, and between these two extremes there may be all grades of implication of the skin. We have generally observed the disease to be worse in winter and better in summer. The eruption has been noted to disappear during general disturbances of nutrition, *e. g.*, in the course of typhoid fever, etc. J. C. White has reported a case in which warty growths supervened on a psoriasis, followed in turn by epitheliomatous degeneration.

Etiology.—The etiology of psoriasis is not known, although various theories, neurotic, toxemic, or parasitic, are held in regard to its nature. Heredity is a factor of considerable importance.

Diagnosis.—The diagnosis of psoriasis offers, as a rule, but few difficulties. The symptoms are very characteristic and pronounced; an eruption consisting of imbricated white scales, seated on red bases, sharply defined from the surrounding integument, affecting the extensor surfaces, especially the elbows and knees, and almost invariably involving the hairy scalp, itching but little if at all, and entirely dry throughout—are all features whose significance it is not easy to mistake. It must be confessed, however, that atypical, ill-defined phases of the disorder are sometimes present that render considerable care in diagnosis necessary. The following diseases should, therefore, be differentiated, namely, syphilis, especially the scaling types; squamous eczema, seborrhea, and lichen planus.

Prognosis.—Psoriasis as usually encountered does not interfere with the general health, and is only of importance from the disfigurement and discomfort it occasions. Relapses are the rule, but their frequency and the extent of the eruption will vary in different cases. It may be said in a general way that a given outbreak may be removed, but the time necessary to accomplish this result cannot always be precisely stated; nor can the physician declare how long a period will elapse before the eruption returns. We believe that much can be accomplished in modifying the course of the disease by constant and intelligent supervision on the part of the medical attendant, provided he has the cooperation of the patient in his endeavors.

Treatment.—It is often of considerable importance to treat the patient as well as the psoriasis. We mean by this that the mere empirical administration of a drug must be supplemented or superseded by attention to diet, to apparent defects of health, and a study of personal idiosyncrasies and peculiarities. For example, dyspepsia must be corrected, anemia relieved, and the gouty or lithemic state suitably combated.

In the full-blooded subject of gouty tendencies alkalies are undoubtedly efficient, aided perhaps by colchicum. A. R. Robinson recommends for such purpose the following mixture:

R—Potassii acetatis	℥j
Spiritus ætheris nitrosi	℥iv
Vini colchici	℥ij
Syr. aurantii	℥jss
Aquæ carui q. s. ad	℥vj—M.

S.—Dessertspoonful in a wineglassful of water after meals.

Arsenic may be combined with this mixture in suitable doses.

When the eruption is of an acute type the wine of antimony in 5- or 6-minim doses, three times a day, may be given with benefit, as recommended by Morris.

Iron is of great value in children who appear anemic and out of health; and the emulsion of cod-liver oil with the hypophosphites and lactophosphate of lime is often administered with advantage.

In a certain number of cases, probably the majority, no especial exciting or complicating cause can be detected, and if we wish to treat the patient internally we must have recourse to empirical remedies. At the head of the list stands arsenic, a remedy that finds its especial field of utility in psoriasis, the disease for which it was first prescribed by Girdlestone. The remedy may be given in the form of Fowler's solution, Pearson's solution, the Asiatic pills, tablet triturates, powders, or in fact in any manner best borne by the patient. In this country and in England Fowler's solution given immediately after meals is the favorite mode of administration. The following formula is in common use:

R—Liq. potassii arsenitis	℥ij
Vini ferri q. s. ad	℥iv—M.

S.—Teaspoonful in wineglass of water directly after meals.

We rarely find it necessary, or think it advisable, to give more than 5 minims of the solution to an adult, as we believe that any good to be got from it may be obtained from

moderate doses long continued. In the beginning it is well to begin with even smaller doses (1 to 2 minims), and proportional quantities to children, although they bear relatively larger amounts of the drug.

Arsenic acts slowly, and if there are no contra-indications to its use it must be continued for weeks before its therapeutic value can be determined. While it cannot be denied that arsenic is of great benefit in some cases, it must be admitted that its action is capricious, and in other cases, where it is perfectly tolerated, it fails of any good effect. It should not be employed in acute outbreaks, and it is not especially effectual in old, chronic, diffuse cases. It is most beneficial in the guttate forms.

A convenient formula for the well-known Asiatic pills is as follows:

℞—Pulv. acidi arseniosi gr. j-ij
 Pulv. piperis nigræ,
 Pulv. glycyrrhizæ rad. aa ʒij—M.
 Div. in pil. No. xl.
 S.—One pill after meals.

Hebra was in the habit of increasing the dose to the limit of tolerance. The method is not to be recommended. The same may be said of the hypodermic injection of Fowler's solution, a mode of employment that would not be long tolerated in private practice. Corlett thinks well of the bromide of arsenic by the mouth.

Among other remedies for internal use in psoriasis, that have been advocated from time to time, may be mentioned cantharides, tar, carbolic acid, copaiba, turpentine, and phosphorus. Some years ago one of us¹ made a trial of chrysarobin internally, being induced thereto by Napier's experiments with the drug, but we soon gave up the practice as being of doubtful efficacy and certainly very disagreeable in its effects on the patient. The huge doses of iodide of potassium recently recommended by Haslund and others we have not tried, and think them dangerous.

¹ Hardaway.

A few years since Bramwell first advocated the treatment of psoriasis by thyroid extract, and, while it did good in some cases, the result on the whole has been disappointing. Crocker still seems to think highly of it in the "right cases," but he does not clearly define the indications for its use.¹ Our own experience is far from gratifying, and we now limit its employment to inveterate forms of the disease. Crocker advises that only one tabloid a day of the dried extract should be given at first; after three or four days two may be tried; and if at the end of a week or ten days no bad effects are observed, three tabloids daily may be prescribed. If no effect is produced in a month its employment should be abandoned.² The same authority praises highly salicylate of sodium or salicin, especially in acute cases where arsenic and thyroid extract are contra-indicated. The dose given is 15 gr. three times a day, for an adult, of the sodium salt, or 15 to 20 gr. or more of the salicin. In our opinion the salicin is preferable, since salicylate of sodium in large doses may set up an albuminuria. These drugs are not apt to be beneficial in limited chronic patches with but little hyperemia.

Crocker also recommends 3 to 5 gr. of quinine dissolved in the acid portion of an effervescing citrate of potassium solution in widespread, inflammatory conditions of psoriasis.

The **local treatment** of psoriasis is of especial importance; indeed arsenic and such-like remedies produce in an indirect way, and by a circuitous route, the same changes in the skin that come from the local application of the tars and other topical stimulants. The first thing to be done in all cases is to remove the scales thoroughly, so that the remedy may come in direct contact with the diseased surface. Where larger surfaces are involved, alkaline warm baths (carbonate of potash or soda, 4 or 5 oz., to water, 30 gal.), preceded by frictions with green soap, and followed by inunctions with vaselin, serve the purpose very

¹ Twentieth Century Pract. Med., p. 275.

² Thyreoidin may be used instead.

well and are in themselves curative. In general acute cases the soap frictions should be omitted.

The scales may be removed from localized patches with soft soap and a nail-brush. The following solution of salicylic acid may also be rubbed in with advantage:

R—Acidi salicylici ʒj
Alcoholis ʒiv—M.

The following salve, recommended by Jamieson, is also efficacious in getting rid of the scales:

R—Ammonii carb. ʒijss
Lanolini ʒvj
Cerati Galeni ʒjss—M.
S.—Apply twice daily.

Steam and hot-air baths are valuable for this purpose, especially the latter, to which Stelwagon ascribes a curative effect as well. Rubber gloves and sheets of MacIntosh worn next the skin are a great help in severe cases.

For the direct local treatment of the disease a large array of remedies has been proposed, and every day witnesses new accessions to the list. We shall, however, direct attention only to those that have proved most efficacious in our own experience. In acute, generalized forms of the disease, warm alkaline baths, followed by inunctions with vaselin, not only remove the scales, but sometimes cause the disappearance of the eruption. Mopping with the zinc and calamine lotion also relieves the hyperemia. For chronic cases and more or less limited patches, chrysarobin is undoubtedly the best remedy. Although it has many objectionable features, we believe that in suitable cases, and in proper situations, it removes the eruption more speedily than anything else.

It may be employed as an ointment, or in the shape of a paint. An ointment made with lanolin or vaselin gives the best results. We prefer this formula:

R—Chrysarobini ʒss
Ung. aq. rosæ ʒij
Lanolini ʒvj—M.
S.—Local use.

Frictions made with this salve soon remove the eruption, but in addition to irremediably spoiling the underclothing it occasions more or less dermatitis, thereby necessitating its discontinuance. For this reason the pigments made with collodion or traumaticin are to be preferred, although they also have in a less degree the same objectionable features. The preparation advocated by G. H. Fox is made in this way:

R—Chrysarobini	gr. xlviii
Acidi salicylici	gr. xlviii
Ætheris	ʒj
Collodii flex.	q. s. ad ʒj—M.

As a rule we order the pigment made with the solution of gutta-percha, after Auspitz's method:

R—Chrysarobini	gr. xxx—xlviii
Acidi salicylici	gr. xxx—xlviii
Traumaticini	ʒj—M.

S.—Apply with camel's-hair pencil every fourth night; then take a warm bath and reapply the remedy.

Besnier recommends that a 15 per cent. solution of chrysarobin in chloroform be first painted over the eruption with a stiff brush, which, when dry, is to be followed by a varnish of traumaticin.¹ In a few days after the application of any one of these pigments the coating begins to peel off; this should be facilitated by a warm bath, after which another application may be put on.

Chrysarobin should not be used on the face, scalp, about the privates, or where the skin is very thin. If very much dermatitis is set up, the chrysarobin should be discontinued, and only renewed after its subsidence, in the mean time mopping on the calamine and zinc lotion. If the drug is going to prove of benefit its good effects are manifested in a few days. It should be kept up until the patches are quite free of scales. The appearances left behind after the use of chrysarobin are quite characteristic, the

¹ Traumaticin is a 10 per cent. solution of gutta-percha in chloroform.

former areas of disease remaining for a season preternaturally white, while the surrounding integument is deeply discolored.

Pyrogallie acid in ointment, or, better, in pigment (1 drachm to 1 oz.), is somewhat slower in its action than the chrysarobin, but it is cleaner, and were it not that it cannot be used over too large surfaces, on account of toxic effects sometimes ensuing, it would in many cases largely take the place of the former.

In former years tar was the chief remedy in psoriasis, and it is still regarded very favorably by many.

It may be used in the form of the official ointment, or as the oleum cadini or oleum rusci, variously diluted or pure. We have generally used the tincture of green soap with tar.

R—Saponis olivæ præp.,
 Olei rusci,
 Alcoholis aa 3j—M.
 S.—Rub firmly into the patches twice a day.

Greenough suggests the following as an eligible formula in private practice:

R—Olei cadini,
 Glycerini,
 Alcoholis aa 3j—M.

Tar may also be prescribed in the form of an alcoholic tincture, or the liquor carbonis detergens and the liquor picis alkalinus, pure or diluted, may be painted over the eruption.

Sulphur sometimes acts very well in comparatively mild cases. We generally order it combined with salicylic acid.

R—Acidi salicylici ʒj-3ss
 Sulphuris præcip. ʒjss
 Vaselini 3j—M.
 S.—Rub in thoroughly twice a day.

In the modified Wilkinson's ointment we get the benefit of both tar and sulphur:

R—Sulphuris sublimati,	
Olei cadini	aa 3iv
Saponis viridis,	
Adipis	aa 3j
Crete præp.	3ijss—M

This preparation is of especial value in much infiltrated plaques. The Vleminckx's solution, pure or variously diluted, is useful in a similar condition of affairs.

Among other remedies of more or less efficacy may be mentioned thymol, turpentine, creosote, naphthol, anthra-robin, and the mercurials. Eugallol is highly esteemed by Kromayer. It is applied as a paint, once daily, and when dry the part may be dusted with zinc oxide.

What has been said above in regard to the treatment of psoriasis refers more especially to the disease as it exists on the general surface, but occurring on the face, scalp, hands, or feet, the method of procedure must be somewhat modified. Psoriasis on the face is best treated by the white precipitate salve:

R—Hydrarg. ammoniati	gr. xx—3j
Ung. aq. rosæ	3—M.
S.—Local use.	

A paste is usually more agreeable and equally beneficial;

R—Hydrarg. ammoniati	gr. xx—3ss
Zinci oxidi	3ss
Pulv. amyli	3ij
Vaselini	3j—M.

S.—Apply in thin layer to eruption.

The mercurial should not be applied over too large a surface at a time, for fear of absorption.

The sulphur and salicylic acid ointment is also useful here. On the scalp the scales should be first washed out with the tincture of green soap, after which, according to circumstances, may be applied some preparation of tar, mercury, or sulphur. Among the efficient preparations for this purpose are the following:

R—Liq. carbonis deterg.	3j
Hydrarg. ammoniati	3ss
Vaselini	3j—M.

S.—Apply to scalp.

R—Olei rusci	. . . . .	3j
Glycerini	. . . . .	3ij
Alcoholis	. . . . . q. s. ad	3vj
Olei rosæ	. . . . .	q. s.—M.

S.—Apply with medicine dropper and rub in thoroughly.

The sulphur and salicylic acid salve already mentioned is also beneficial. Psoriasis of the palms and soles may be treated with much satisfaction by applications of the compound salicylated soap plaster spread on muslin, as well as by the pigment of chrysarobin and salicylic acid. Since in many cases psoriasis is either greatly better or entirely disappears in summer, it is natural to presume that residence in a warm, equable climate would prove beneficial in the disease; and as a matter of fact this presumption is justified by experience.

Hyde and Montgomery prescribe sun-baths in psoriasis, and Stelwagon recommends the arc-light for the same purpose. Pospelow obtained great improvement in a case of psoriasis of the nails of five years' standing, after a few light baths, together with paintings of a 5 per cent. chrysarobin traumaticin.

Holz knecht obtained disappearance of patches with one-minute applications of radium of high activity.

Oudin, Williams, and Grube highly recommend high-frequency currents. Allen says they ease the itching and cause disappearance of recent patches.

The general consensus of opinion as to the use of the *x*-ray may be stated under the following heads:

1. The *x*-ray is not recommended for routine use in psoriasis, but only for cases which resist the usual methods.
2. It finds its chief use in the treatment of chronic isolated patches, as at the knees, elbows, and sacrum.
3. In such cases it generally gives very satisfactory results as far as the removal of lesions is concerned.
4. The tendency to recurrence is nowise lessened by this treatment; some, indeed, think it is enhanced.
5. The ray acts in the same manner as topical applications of the chrysarobin class, that is, by exciting leukocytosis.

6. An early favorable sign is the disappearance of the familiar punctate bleeding on erosion.

7. An area of pigmentation often persists for some weeks, sharply margined at the border of the patch, and gradually fading into the surrounding healthy skin.

Williams gives from 6 to 10 exposures on alternate days. Startin succeeded in an inveterate case with 3 exposures at intervals of three days. Scholtz repeats irradiation daily for some three days, then every other day, and later every three days, giving ten-minute sittings at 21 inches. Holz knecht, Kienböck and Belot use single sittings, the latter sometimes two. The dose advised varies from 3 to 6. H. Belot, with an anticathode at 5 inches, gives a fifteen-minute sitting one day, with one of five or ten minutes the next. In multiple foci, Kienböck uses a distance of 12 inches for three minutes without shielding. Stelwagon, using a $\frac{1}{2}$ - to 2-inch tube at 6 to 12 inches distance, moves it about from place to place, allowing the ray to play from three to ten minutes on one region, progressing cautiously from the shorter to the longer. Two to three times a week is sufficient. Dermatitis should be avoided. Allen recommends a preliminary removal of the scales.

Finally, it may be said that the *x*-ray is especially valuable in psoriasis of the nails.

ADDITIONAL PRESCRIPTIONS.

R—Acidi salicylici	5ijss
Chrysarobini,	
Olei rusci	āā 3v
Saponis viridis,	
Vaselini	āā 3vj
	Dreuw.
R—Chrysarobini,	
Ichthyolis	āā gr. xx
Acidi salicylici	gr. viij
Ung. zinci oxidi	gr. c.c.
Vaselini	q. s. ad 3j—M.
	Unna.

R—Chrysarobini,	
Liq. carbonis deterg.,	
Hydrargyri ammon.	āā gr. x
Adipis benzoati	3j—M.

S.—Remove scales and rub in for one-half hour. Leave salve on all night. Bath in morning. Hutchinsonson.

R—Acidi pyrogallici	gr. x-xl
Acidi salicylici	gr. x
Ætheris	3j
Olei ricini	ṡv
Collodii	q. s. ad 3j—M.

S.—Paint on parts once every two or three days. Stelwagon.

R—Thymolis	gr. xv-3iij
Vasellini	3j—M.
	Crocker.

R—Pulv. naphtholis	3jss
Saponis viridis	3v
Cretæ præp.	3j
Adipis	3x—M.
	Kaposi.

PITYRIASIS MACULATA et CIRCINATA.

Description.—This affection, which is also called pityriasis rosea, was originally described by Gibert, but Duhring was the first in recent years to redirect attention to it.

Brocq states that, anticipating the general eruption by from four to fifteen days, there appears about the waist, neck or arms, a single patch. This patch is oval or circular, its edges are of a bright red, and it is a little elevated and covered with delicate scales. Subsequently, and more or less suddenly, a great number of patches make their appearance, and the whole body, with the exception of the hands and feet, may be affected, but the sites of predilection are the upper portions of the trunk.

The eruption presents two apparently distinct types: the macular type, consisting of small pin-head to pea-sized lesions, rosy-red in color, not clearly defined, and having a scaly surface; the other, or circinate, form possessing a

rounded or oval outline and a well-defined border, which may attain a diameter of from $\frac{1}{2}$ to 1 inch.

The larger patches are developed from the small primary lesions, and in many instances they undergo a central involution, and present red and scaly peripheral rings and characteristic "parchment-like" centres.

In course of time these rings become broken, and by the coalescence of segments of other circles various gyrate figures may be formed. Many of the lesions, however, do not pass through the same stages of development, and as a consequence the different forms mentioned above may be present at the same time.

Subjective symptoms are not marked, and consist mainly of slight burning or itching. The disease is self-limited, tending to spontaneous recovery in from two weeks to as many months.

Etiology.—The etiology of the disease is obscure. It is sometimes observed to be quasi-epidemic, and occasionally two members of a family may be affected. Pityriasis rosea should be differentiated from ringworm, seborrhea, and especially syphilis.

Prognosis.—This is invariably good.

Treatment.—**Internal remedies** are not required, although Crocker believes that 10 or 15 gr. of salicin, three times a day, shortens the duration of the disease.

If itching is a prominent symptom, the zinc and calamine lotion, with a few drops of carbolic acid to the ounce, will readily allay it. Hyde and Montgomery recommend the following plan of treatment: The patient takes a bath at night, and after drying the skin applies to the eruption a weak vinegar or dilute acetic acid lotion; before this application is quite dry a 10 to 15 per cent. solution of sodium hyposulphite is mopped on, which is followed in turn by a simple dusting powder. The same authors have seen abatement of subjective symptoms and prompt involution of the lesions follow brief exposures to *x*-rays.

The most generally successful treatment is that of Jamieson, as given by Norman Walker in his excellent

text-book, viz., the patient should be soaked daily for half an hour in a bath to which two or three teaspoonfuls of Condyl's fluid (sodium permanganate 1, water 500), have been added, after which a 3 to 5 per cent. salicylic vaselin is freely applied to the skin.

DERMATITIS EXFOLIATIVA.

Description.—In a general way exfoliative dermatitis may be defined as an acute or chronic, general or partial, cutaneous inflammation, in which the epidermis is freely shed in large or small scales.

The following clinical forms represent the disease sufficiently from the standpoint of therapeutics.

Relapsing Scarlatiniform Erythema.—A description of this disorder has already been given (p. 20) and need not be repeated here.

Acute Exfoliative Dermatitis.—Although often primary, this disorder may follow generalized psoriasis, lichen, eczema, or the application of irritating drugs. The involvement of the skin is at first local—in one of our cases beginning as a red patch at the pit of the stomach—but more or less quickly the whole integument may be implicated. The skin is at first free from scales, and may be bright red, violaceous, or of a dusky hue. There is some degree of pruritus. In a few days the cuticle begins to desquamate in large or small, thin, papery scales. The character of the desquamation is influenced by situation; on the scalp it is furfuraceous, on the body and upper portion of the extremities the scales are generally large and more or less imbricated, while from the hands and feet we have seen the epidermis shed in great, thick, glove-like pieces. The hair is shed in the course of the disease, sometimes even the beard, eyelashes, and pubic growth; the nails are also lost. The mucous membranes may also participate in the general process. Some cases are complicated by an ephemeral eruption of vesicles, blebs, or pustules. In

severe cases the general state of the patient may excite much apprehension, either from the extreme emaciation and debility present, or from the existence of serious complications. The affection may last from two to three weeks to as many months. Undoubtedly, there are much milder grades of exfoliative dermatitis than the one just described. There are also local forms.

Chronic Exfoliative Dermatitis, or Pityriasis Rubra.—

According to Hebra and others, pityriasis rubra is a disease *sui generis*. As in the acute form, the disorder begins in one or more localized patches. These coalesce and gradually invade the whole body. The skin may be of a dark or vivid red, or bluish red. The desquamation is very free; the scales are thin and papery on the general surface, imbricated, and from a line to an inch or more in diameter. When the integument is freed of the scales, it has a shining, tense appearance. The skin is not infiltrated as a rule, and there is no moisture. There may be edema of the lower limbs. Alopecia and exfoliation of the nails also occur. The patient complains but little of itching, but his skin feels too small for him, and he is apt to be chilly, even in the warmest weather. Febrile exacerbations occur now and again. The disease lasts months or years; there is generally a fatal termination, either due to progressive emaciation and consequent exhaustion, or else the patient is carried off by some intercurrent affection.

Etiology.—The causes of so complex a disorder as exfoliative dermatitis are various and it must be confessed, for the most part, obscure. We often recognize the clinical condition as following upon psoriasis or eczema, and as the result of the irritating effects of drugs; it has also been thought to occur in connection with gout and rheumatism, and with tuberculosis. Sometimes the subjects of the disease have had no apparent antecedent ill-health.

Treatment.—It may be inferred, from what has just been said about the etiology of exfoliative dermatitis, that there can be no special or invariable form of **internal** treatment for the disease. Of course, obvious predisposing or exciting

influences should be removed if possible, but in the main the constitutional treatment is symptomatic. The acute form is best treated with diaphoretics and diuretics. Salicin in 10- to 15-gr. doses several times a day is invaluable in presumably septic cases. Wine of antimony in from 5- to 7-minim doses has been recommended. Crocker thinks highly of quinine given in an effervescing potash mixture as follows:

R—Potassii bicarbonatis ℥j
 Aquæ destillatæ ℥ss—M.
 Solve.

R—Acidi citrici gr. xij
 Quininæ sulphatis gr. iv
 Aquæ destillatæ ℥ss—M.
 Solve.

S.—Mix the two and drink during effervescence every four hours.

It seems to be definitely established that arsenic is without value and is probably harmful in this disease.

Ten drops each of fluidextract of ergot and tincture of iron have seemed to us to be of some service in chronic cases. When the kidneys are healthy, Malcolm Morris gives opium internally for restlessness and sleeplessness—a recommendation that we can endorse from experience.

Locally, the employment of soothing ointments, lotions, and baths is indicated. Where it can be properly carried out, the following plan of treatment, which is suggested by Mackenzie, is by far the most agreeable to the patient: Two garments are made of lint—a jacket and trousers, with socks of the same material attached. A mask of lint should be used for the face and head. This suit is to be kept constantly soaked with the following lotion: Glycerin of subacetate of lead (B. P.), and pure glycerin, of each 1 oz.; water, to 1 pint. A basin of the lotion, which in cold weather may be warmed, should be kept by the patient's bedside, so that the fluid may be squeezed over the lint suit as often as desired. When the redness of the skin is lessened recourse may be had to greasy applicatons, such as equal parts of vaselin and lanolin. Upon any return of the hyperemia the lead lotion may be again applied.

With a certain number of patients oily applications are at all times more agreeable. The ordinary carron oil is soothing, and can be made antipruritic by the addition of a little carbolic acid or creosote. Lassar's paste, which is often recommended, is usually very annoying when it becomes dry, and the same may be said of Crocker's liniment as generally prescribed: The following modification is more acceptable:

R—Zinci oxidi	3ss
Pulv. calaminæ præp.	ʒj
Liq. calcis,	
Ol. amygdalæ dulcis	aa ʒj
Lanolini	ʒjss—M.

Carbolic acid or the liquor carbonis detergens may be added to this preparation. This liniment may be gently smeared over the affected surfaces with the fingers, or else spread on strips of soft cloth, which in turn should be kept in place by suitable bandages.

Baths at times give considerable relief, and may be taken daily if necessary. Even if baths have no direct medicinal effect, they make the patient more comfortable by ridding him, temporarily, of the acrid accumulations on his skin.

Mackenzie gives the following formulæ for baths in exfoliative dermatitis:

Starch, 1 lb.; bran, 2 to 6 lbs.; linseed, gelatin, 3 lbs.; gluten (size), 6 lbs.; to 30 gal. of water; or alkaline baths, such as borax, 3 oz.; bicarbonate of sodium, 2 to 10 oz.; carbonate of soda, 2 to 6 oz.; to 30 gal. of water; or a compound alkaline bath, as bicarbonate of sodium, 6 oz.; borax, 1½ oz.; water, to 30 gal. The temperature of these baths should be from 98° to 100° F., as may be most agreeable to the patient. The continuous bath, as in pemphigus, has sometimes been employed.

Dermatitis Exfoliativa Infantum. **Description.**—This is a severe form of exfoliative inflammation of the skin, usually unattended by fever, which begins between the second and fifth weeks of life. The disease appears first around the angles of the mouth as an erythema, with

a tendency to the formation of fissures; then this inflammation extends to the rest of the body. The epidermis exfoliates generally after some amount of fluid has accumulated beneath it. The disease is very fatal.

Treatment.—The treatment consists in keeping up the nutrition of the child, and the local use of bland applications.

Dermatitis Exfoliativa Epidemica. **Description.**—This is a rare form of disease first described by Saville, and of which a few cases have been seen in this country. The skin lesions are represented at first by an erythematopapular rash, which is sometimes diffused, or in the shape of blotches, that may be grouped or solitary. Occasionally flat papules were observed which extended after the manner of ringworm. The initial symptoms soon disappear, but are quickly followed by new lesions that become generalized. The second stage lasts from three to eight weeks. In the stage of subsidence the skin is left greatly thickened and of a polished-brown appearance.

Treatment.—The treatment is practically that of any other acute inflammation of the skin, but as a rule nothing seems capable of shortening the course of the disease.

Crocker has, in a few instances, succeeded in abating an attack by painting a small, beginning area with iodine.

PSORIASIFORM DERMATOSES.

Description.—Under the various titles of parakeratosis variegata, lichen variegatus, erythrodermie pityriasique en plaques, lichenoid eruption, etc., writers have called attention to a comparatively rare form of skin disease characterized by disseminated, variously sized lesions, superficially seated, covered with thin scales, arranged in bands or patches, and, owing to the enclosure of normal areas of skin, presenting, in most cases, a reticulated appearance of the surface. The lesions, which are of a reddish or brownish color, may occur on any part of the body, but,

perhaps, prefer the trunk and limbs, and are, as a rule, without marked subjective symptoms. The disorder is exceedingly chronic and resistant to treatment. It is seemingly more common in adult life than in children, and affects women more often than men.

Brocq divides these cases into three classes under the following names: (1) Parapsoriasis guttata; (2) parapsoriasis lichenoides; (3) parapsoriasis in patches.

Treatment.—The treatment is regarded as unsatisfactory, neither internal nor local measures proving of any service. Strong preparations of pyrogallol have been most favorably regarded. In one case of Brocq's third type we secured a comparatively rapid cure of the disease by frequent applications of a wash containing 10 minims of liquor carbonis detergens to 1 oz. of calamine-zinc lotion. On some obstinate patches a salve of 20 gr. of white precipitate and 1 drachm of the tar solution to 1 oz. of vaselin was found valuable.

URTICARIA.

Description.—This common affection, vulgarly called nettle-rash or hives, is characterized by an eruption of pomphi or wheals. These are somewhat firm, more or less elevated, evanescent efflorescences, varying in size from a pin-head to a hen's egg or larger; round, oval, or irregular; of a whitish to rosy color, and most frequently accompanied by intense itching, tingling, or burning. The following variations are noted:

When the lesions are distinctly papular, as is frequently the case in children, the eruption is termed **urticaria papulosa** or **lichen urticatus** (Willan), and when, through unusual abundance of the serous effusion, vesicles and bullæ are produced, **urticaria vesiculosa et bullosa**. True hemorrhage into the wheals constitutes **urticaria hemorrhagica**, or **purpura urticans**. In some persons the irritability of the integument is so great that wheals in any shape or form can be artificially produced by the slightest mechanical

irritation, and words or figures, drawn by the finger-nail or any blunt instrument, take on all the characters of an urticarial lesion—a condition known as **urticaria factitia**. **Urticaria papulosa**, or **lichen urticatus**, as already stated, occurs mainly in children.

The eruption produces an intense pruritus, so that in some cases the primary trouble is hidden by the secondary eczema or pustular dermatitis. Usually, however, the only visible lesions are white or pale-red, small, scratched papules scattered over the surface. In many cases the urticarial element is not apparent at first sight. This form of urticaria is excessively distressing and is apt to keep up for a long period.

It is customary to speak of acute and chronic urticaria, and this division of the subject serves a good purpose in that it helps to direct attention to the etiological factors concerned in the production of the disease.

Acute Urticaria.—The rash may be ushered in with considerable systemic disturbance, the temperature running up several degrees (*urticaria febrilis*); or there may be a day or two of malaise before the eruption makes its appearance, the symptoms of gastric disturbance being well marked. Urticaria of this type may persist for a number of days, being the source of much local and even general distress. On the other hand, a copious eruption of wheals may make its appearance suddenly and without premonition of any sort, and after a longer or shorter period as suddenly disappear. Undoubtedly the mucous membranes may also be involved in the urticarial process and give rise to severe internal disturbances involving the stomach, bowels, and respiratory tract.

Edema of the glottis with fatal results may also occur.

Chronic Urticaria.—In chronic urticaria the eruption comes and goes during a long period of time. These periods of outbreak are, as a rule, quite irregular, although cases have been observed, probably of malarial origin, in which the nettlerash displayed a marked periodicity. The lesions are not apt to be as widespread or numerous as in

the acute form. One of us¹ observed a case of chronic urticaria in which the wheals were limited strictly to the feet and hands, and during the entire period of its existence—several years—it never travelled beyond those parts. Urticaria papulosa of children is a typical example of the disease in its chronic and relapsing form. Closely allied to urticaria is the condition called dermatographism, or autographism. It is a state of potential irritability of the skin encountered in a number of different and diverse disorders, such as affections of the brain and spinal cord, heart affections, rheumatism, hysteria, etc.

Etiology.—Urticaria is due to various **direct** and **indirect causes** acting upon the vasomotor system. The wheal is brought about in all likelihood by a spasmodic contraction of the capillaries, which in turn is followed by paresis and the consequent production of a localized edema from serous exudation. The exciting agencies are very numerous, and may be of central, peripheral, or reflex character.

Among the local causes of urticaria may be mentioned irritants of all sorts, such as the bites of insects,² coarse flannels, certain vegetable substances, the local application of electricity, etc.

The indirect causes are infinitely more numerous, and somewhat difficult to classify.

Derangement of the gastro-intestinal tract occupies above all the first place in the etiology. Here we find that foods and medicines of many kinds, or, perhaps, of any kind under certain circumstances, may give rise to urticaria. Among the first named may be especially mentioned: shell-fish, pork, oatmeal, pastry, buckwheat, and strawberries; and among the latter, preparations of cinchona, copaiba, and cubebs. Intestinal worms often excite the disease in children, and malaria may evoke a decidedly intermittent type of nettlerash.

Attention has been called to the fact that urticaria may occur after puncture of an echinococcus cyst. The chronic

¹ Hardaway.

² Hutchinson. Lichen urticaria.

forms of the disease are observed in connection with various disorders of the male and female sexual apparatus, in affections of the stomach, bowels, kidneys, and liver; also as depending upon various disturbances of the brain and spinal cord, and in alternation with attacks of asthma. Hirschberg has pointed out the frequent coincidence of hyperchlorhydria with urticaria. Paramore demonstrated by Wright's oxalic acid test the existence of a diminished coagulability of the blood (deficiency in calcium salts) in certain cases.

Prognosis.—Acute urticaria is readily recovered from when the offending cause is removed. In chronic cases the prognosis should be guarded, as it is sometimes very difficult to discover and eradicate the exciting influence. Occasionally urticaria is fatal from edema of the glottis.

Treatment.—In all cases the cause must be ascertained and removed if possible. Mild outbreaks often pass away without any special treatment beyond relieving the local distress. Acute attacks are generally due to gastric disturbance from irritating foods, etc., and when severe the stomach must be emptied by emetics, and castor oil or some other mild aperient given.

Sometimes such a condition will persist, being kept up by repeated exacerbations, for a number of days, and produce a condition of mind and body hardly short of agonizing. In such instances the state of the mucous surfaces is perhaps closely allied to that seen on the skin, and the treatment should consist of soothing substances like bismuth combined with magnesium carbonate. At the same time alkaline mineral waters should be taken copiously. The diet should be bland and unirritating. In the majority of cases of recurrent urticaria it will be found that some article of food or drink is at the bottom of the mischief; consequently, whatever is obnoxious in this respect should be ferreted out. Indeed, in treating chronic urticaria it must be constantly remembered that, under certain circumstances of idiosyncrasy, the disease may be set up by the most various and diverse causes, and in intractable

cases the physician must carefully study the history, health, and habits of each patient. The main lines of this investigation are indicated under etiology. When diminished coagulability of the blood can be shown, as indicated above, the calcium salts should be administered. Wright strongly advises the chloride; 20 gr. well diluted may be given after meals, which may be increased to 40 gr. or more. It should be continued a long time.

Generally success will attend judicious efforts made in these directions, but unfortunately there will remain a residuum of cases that are apparently without cause. In such instances we must resort to empirical remedies. C. Heitzmann has spoken well of ergot in full doses, and we have occasionally seen it succeed. Belladonna and atropia may be tried in appropriate doses. Among other remedies may be mentioned quinine, iodide of potassium, and salicylate of sodium or strontium. Pilocarpine hypodermically or by the mouth is sometimes valuable. Antipyrine and phenacetin will give temporary relief. Wine of antimony in 5-drop doses often does good. Ichthyol internally in the dose of from 2 to 6 gr., three times a day, often acts well. It is best given in pill or capsule.

Lotions of soda and water, vinegar, pure or diluted, brandy, whisky, cologne, alcohol, etc., are all well known and often useful domestic remedies for **local application**. Carbolic acid is probably the best antipruritic agent in our possession. It is generally mopped on the surface in the form of a lotion, but we think it is very much more efficacious if sprayed on through an atomizer:

R.—Acidi carbolici	3ij-iv
Glycerini	3j
Aquæ	q. s. ad 3xvj—M.
S.—Use as a spray.	

To increase the effect 5 to 10 drops of the oil of pepper-mint may be added to each atomizerful of the preparation.

The liquor picis alkalinus and liquor carbonis detergens may also be used, in the same strength as the carbolic acid, in the form of a spray.

The often-quoted calamine and zinc preparation is also very valuable as a lotion, combining with it a small quantity of carbolic acid:

R—Acidi carbolici	℥j
Zinci oxidi	℥ss
Pulv. calaminæ præp.	℥iv
Glycerini	℥j
Liq. calcis	℥vj—M.

S.—Mop on freely.

Menthol combined with carbolic acid will afford relief, at least temporarily:

R—Mentholis	℥ij
Alcoholis	q. s.
Acidi carbolici	℥ss
Lotionis zinci oxidi comp.	℥vj—M.

S.—Mop on with soft rag.

Among other remedies of this class are to be noted a solution of benzoic acid (℥j—℥xvj); menthol in solution with alcohol and water (R—Mentholis, gr. xxx—℥ij; glycerini, ℥ss; alcoholis, ℥jss; aquæ, q. s. ad ℥jv—M.); thymol (gr. j—℥j) and borax (gr. v—℥j).

Bromokoll in a 10 or 20 per cent. paste or salve has been highly recommended as an antipruritic, but we have had no great amount of satisfaction from its use.

Ointments sometimes give relief when lotions fail. For limited eruptions chloral and camphor (R—Camphoræ, chloralis, āā ℥ss—℥j; unguentum aquæ rosæ, ℥j—M.) or menthol (R—Mentholis, gr. x—℥j; vaselini, ℥j) may be employed. Tar in salve form is beneficial, but dirty. A soft, cream-like preparation recommended by MacIntosh in eczema is equally serviceable in urticaria:

R—Bismuthi subnitratæ	℥ij
Zinci oxidi	℥ss
Glycerini	℥jss
Acidi carbolici liq.	℥xx-xxx
Vaselini	℥vj—M.

S.—Apply with fingers or brush.

Baths, both acid and alkaline, may be administered in certain cases. Bulkley suggests, in chronic cases, a bath

containing carbonate of potassium, ℥viij; carbonate of sodium, ℥vj; borax, ℥iv. Of these ingredients take from two to four teaspoonfuls with an equal quantity of starch to each gallon of water. After the bath, when the body is dry, the surface should be anointed with carbolated cosmo-line. Galvanic and faradic electricity often give marked relief. Gregor reports a case of two years' standing cured by six applications of the high-frequency effluve and condensation couch. In persistent, recurring cases, Allen recommended general effluvia with a pointed, metallic electrode.

ADDITIONAL PRESCRIPTIONS.

R̄—Bismuthi subcarbonatis gr. x
Magnesii carbonatis gr. v—M.

Ft. chart. No. j.

S.—One powder after meals and at bedtime. For acute cases.

R̄—Cerii oxalatis ℥ijss
Bismuthi subcarbonatis ℥ij
Magnesii carb. levis ℥iv—M.

S.—Even teaspoonful in water between meals and at bedtime. In urticaria due to hyperacidity.

R̄—Eau de Cologne ℥ij
Zinci oxidi ℥ss
Liq. carbon. deterg. ℥ss
Aquæ destillatæ ℥xvij—M.

S.—Apply with a brush or rag and allow to dry. Whitla.

R̄—Calcii lactatis gr. xxx
Aquæ anisi ℥ij—M.

S.—To be taken at once. In cases when attack is due to eating sour fruit. Whitfield.

URTICARIA PIGMENTOSA.

Description.—Urticaria pigmentosa (xanthelasmaidea, Fox) is a rare type of urticaria and differs in many particulars from the forms just described. It begins within the first six months and occasionally within the first few days of life, although Elliot reports a case that did not begin until the twenty-seventh year. The first evidence of the disease is the eruption of reddish-yellow wheals,

which may either disappear and leave in their stead dark-brown or black macules, or they may remain indefinitely as yellowish-brown nodules. At times the lesions are complicated with vesicating apices, or even bullæ form surrounded by a zone of congestion.

Its course is essentially chronic, and while the older lesions are passing away new ones are forming, so that the different stages are often all present at the same time and make up a truly variegated picture. It affects mainly the trunk and neck, then the head, face, and limbs. An analogous condition has also been observed in the mouth and pharynx. Urticaria factitia is common. Itching may or may not be present. After an indefinite and variable length of time new lesions are no longer evolved, those already formed disappear, and about the time of puberty or sooner the trouble has run its course, though in a case reported by Levinski tubercles were still appearing at the age of eighteen.

Most authors agree that the disease should be classified among the neuroses of the skin, or, as Hallopeau expresses it, among the trophic neuroses. The characteristic histological expression of the disease is the presence in great abundance of "mastzellen." The coloration of the lesions is due to the presence in the deeper layers of the epidermis of pigment granules.

The **treatment** is unsatisfactory, but relief may be given to a certain extent by the remedies employed in ordinary urticaria. In one of Crocker's cases the development of new lesions was inhibited by the administration of arsenic. Török and Schein report a cure by producing an acute x-ray dermatitis.

ACUTE CIRCUMSCRIBED EDEMA.

Description.—The disease usually comes on without warning in the shape of circumscribed edematous patches, varying in size from a hickory nut to an orange, of a

light or dark red color, and disappears as rapidly as it came. There is little or no itching, but probably some burning and a sense of tension. The lips, cheeks, eyelids, the limbs, and the mucous membranes of the mouth, pharynx, and larynx may be attacked. Many different localities may be affected simultaneously, or one only; vomiting and diarrhea may accompany an attack, and Joseph has seen paroxysmal hemoglobinuria associated with it. Recurrence is the rule, and in some instances the disorder is clearly hereditary. It is certainly closely allied to the giant urticaria described by Milton. When the disease attacks the larynx it may cause death by suffocation unless promptly relieved.

Treatment.—The treatment is essentially that of urticaria (*q. v.*). Ichthyol in 5-gr. doses, three times a day, is recommended by Forster.

LICHEN PLANUS.

Description.—Wilson says of lichen planus that it is a very remarkable form of eruption, consisting of papules that are broad at the base, flat and seemingly glazed on the summit, slightly umbilicated, of a dull, purplish-red color at first, in certain situations discrete and isolated, in others united by a hyperemic and infiltrated base into patches of variable extent. Examined somewhat more in detail, and in the light of further study, we are enabled to determine the following features:

The eruption is usually symmetrically disposed. It may appear upon any part of the body, but the sites of predilection are the flexor sides of the forearms, about the wrists particularly, the flanks, around the waist, lower part of the abdomen, around the knees and on the calves, less frequently on the hands and feet, and also on the mucous membranes. We have twice seen the disease on the face.

The lesions consist, in the beginning, of round, red papules, that finally become more or less angular in outline, varying in size from a pin's head to a split pea, which project abruptly from the surface of the skin to the height of about a line. The surface of the papules is smooth and shining, quite often depressed in the centre, and sometimes in the larger papules may be seen white, milium-like spots, that can be dug out, and consist of epithelium.

After reaching their full development, the papules do not increase by peripheral extension, as in psoriasis, for example, but they may go on multiplying in number. According to Robinson the surfaces of the small, isolated papules are devoid of scales, but in older and larger lesions a thin, transparent layer of horny cuticle is present.

Wickham states that on the papules, when one is accustomed to observe them, may be seen certain whitish points and striæ, which are quite characteristic, and are similar in appearance to the whitish lines found on the mucous membranes, especially the cheeks, when those parts are affected in this disease.

The papules may remain isolated throughout their course, or they may be disposed in groups, lines or bands, or have a ring-like arrangement. By increase in the number of lesions, and their close aggregation, variously sized, sharply limited, elevated patches appear, which are covered with scales and closely resemble psoriasis. At times large surfaces may be thus involved. The term lichen verrucosus is applied to chronic infiltrated plaques whose surfaces may be plush-like, or else horny and scaly (Jamieson). These patches may be of various sizes, and are prone to involve the lower limbs. Vesicles and blebs have been noted as rare complications. A number of variations from the classical form of the disease have been recorded.

It is characteristic of lichen planus that the older lesions leave behind them marked pigmentation and even atrophic spots. Itching is present in varying degrees—sometimes

slight or again very intense. The hair and nails are never implicated. The majority of patients with lichen planus that have come under our observation have been in good, sometimes robust health, or else have exhibited only such systemic disturbances as may be found preceding or accompanying any other affection of the skin.

T. C. Fox, Crocker, and others have described a form of lichen planus occurring in children. The papules are acuminate at first, but later become flattened; they show a tendency to grouping, and are accompanied by much itching. They come out suddenly, and it is said may be made to disappear quickly by soothing applications.

The disease, we believe, is met with more frequency in females, certainly in our own experience. It is most apt to occur in adult life, although not unknown in childhood.

The essential **etiology** is obscure. Very often no apparent exciting cause can be determined; at other times a probable causal connection may be established for various forms of nervous exhaustion, digestive and uterine derangements, rheumatism, etc.; in fact, just such disorders of the health as we are in the habit of connecting with eczema and the like cutaneous affections.

Diagnosis.—The diagnosis of lichen planus is usually easy. The large, angular lesions depressed in the centre, their shining aspect, purplish color, typical situations, and usual symmetry concur in presenting a clinical picture that is readily recognized. Psoriasis, syphilis, and papular eczema should not be confused with this affection.

Prognosis.—The prognosis is generally good, as regards recovery, but the length of time required to effect a cure cannot be foretold with any exactness. Relapses are not uncommon. Cases that have long resisted treatment will occasionally make a rapid, spontaneous recovery.

Treatment.—As regards the **internal treatment** of lichen planus, complications should be removed if possible, and any appreciable defect of the general health should receive the proper attention. The majority of patients, in our experience, have shown evidence of neuro-

pathy. This seems especially true of those cases in which the lesions are markedly pruritic. Treatment should accordingly be directed to this condition. We have often found the bromides of use. Whitfield uses opium in cases with much itching and nervous excitement, not only for its effect on the nervous condition, but on the eruption as well. A few days' rest in bed will occasionally have a magical effect; when the disorder is associated with overwork, worry, or insomnia, a removal of these conditions will sometimes effect a cure. We have seen a vacation work a cure.

In acute cases the alkaline diuretics may be given with advantage.

R—Potassii acetatis	3ss-3j
Tr. nucis vomicæ	3ij
Infus. gentianæ.	q. s. ad 3iv—M.

S.—Teaspoonful in a wineglass of water after meals.

Quinine in fairly large doses, 8 to 12 gr. a day, and salicin in 15-gr. doses thrice daily are also valuable in the generalized hyperemic cases. In similar conditions we have seen benefit from the chloride of calcium, 20 to 40 gr., well diluted, three times a day. Brooke gives 15 minims of the wine of antimony, three times a day, and has found it very helpful. When a neurasthenic condition exists we prescribe, for the rich, change of air and occupation, and, for the poor, extract of cannabis (Allen's) in $\frac{1}{4}$ gr. doses. When there is hysteria, this drug is at times productive of harm.

In subacute and chronic cases of lichen planus, more especially those in which the disorder involves extensive portions of the body, the remedies of greatest value are arsenic and mercury. Arsenic is usually prescribed in the form of Fowler's solution, but any of the other preparations of the drug may be employed, or it may be given subcutaneously.

If Fowler's solution is selected, it is best to begin with 2 drops, largely diluted, immediately after meals, and then gradually to run it up to 8 or 10 drops, unless the

point of tolerance is reached with a smaller dose, which often happens. If the disease should be made worse by the arsenic, or no effect on the disease be noted, its use should be abandoned, and some preparation of mercury given in its stead. Mercury either in the form of the bichloride or the biniodide, our own preference being for the latter, may be prescribed in the dose of $\frac{1}{32}$ to $\frac{1}{12}$ gr. The biniodide may be given in pill form or in the following mixture:

R—Hydrargyri biniodidi	gr. j-ij
Potass. iodidi	3ss
Ess. pepsini	3ij
Aquæ	q. s. ad 3iv—M.

S.—Teaspoonful in one-quarter glass of water after meals.

It is always well to continue the internal treatment for a number of weeks after the disappearance of the eruption.

Locally, in acute cases, when considerable surface is involved, alkaline baths and soothing lotions are demanded. The calamine and zinc lotion, to which has been added a small quantity of tar, is admirable for the itching:

R—Liq. carbonis detergentis	3j
Lotionis zinci et calaminæ	3vj—M.

S.—Mop on frequently.

Instead of the tar, 2 drachms of menthol, first dissolved in a little alcohol, may be added to the zinc and calamine lotion; or the menthol may be ordered in the form of a salve.

In chronic cases the treatment should be more stimulating. Wilson recommended a bichloride of mercury lotion of the strength of 2 gr. to 1 oz. Vleminckx's solution may also be employed, which latter, however, should be diluted at first. Unna extols the following, with which the patient should be rubbed twice a day, being kept in bed in the mean time:

R—Hydrargyri bichloridi	gr. ij-v
Acidi carbolicæ	gr. x-xx
Ung. zinci oxidi	3j—M.

The following formula may also be used to advantage in some instances:

R \bar{y} —Liq. carbonis detergentis	3j
Zinci sulphatis,	
Potassæ sulphuratæ	āā 3ij
Glycerini	3ij
Aquæ rosæ	q. s. ad 3iv—M.

We have used a pigment of chrysarobin and salicylic acid with much satisfaction in localized patches.

R \bar{y} —Chrysarobini	gr. xl
Acidi salicylici	gr. xl
Traumaticini	3j—M.
S.—Paint on with camel's-hair pencil.	

The tincture of green soap with tar is also valuable. We generally prefer the following formula of Piffard's, somewhat modified:

R \bar{y} —Saponis olivæ præp.	3iv
Olei rusci,	
Glycerini	āā 3j
Olei rosmarini	3jss
Alcoholis	q. s. ad 3vii $\frac{1}{2}$ —M.

S.—Rub in with a piece of flannel.

Jacquet and Brocq warmly advocate hot sedative douches. The water of a temperature varying between 34° and 38° C., according to personal susceptibility, is poured upon the body from a watering pot with a wide nozzle, care being taken that it should not be projected too energetically. The duration of the douche is two to five minutes. Sometimes this process may be concluded with a cold jet of water lasting a few moments. We have, on the other hand, had good results from cold water alone.

The α -ray, used much in the same way as for psoriasis (p. 148), is invaluable in the treatment of infiltrated and localized forms of the disease; indeed this agent has largely superseded the strong medicinal applications just mentioned, and the cautery applications of Lassar and others. In generalized lichen planus we have not obtained such good results from the α -ray. We have not been much

impressed with the value of the high-frequency current, although both it and static electricity have been recommended in close and dense patches. In such cases Stelwagon uses labile applications of a weak galvanic current.

ADDITIONAL PRESCRIPTIONS.

R—Ol. rusci (vel cadini)	. . . . .	3j
Ung. hydrargyri	. . . . .	3ij
Ung. simplicis	. . . . .	3j—M.
S.—Local use.		Taylor.

R—Liq. plumbi subacetat.	. . . . .	℥xv
Liq. picis carb., B. P.	. . . . .	℥xv
Ung. zinci	. . . . .	3j—M.
S.—As a soothing application.		Brooke.

R—Liq. picis carb., B. P.	. . . . .	3j
Hydrarg. perchloridi	. . . . .	gr. ij
Spts. vini rectific.	. . . . .	3iv
Aquam destillat.	. . . . . q. s. ad	3xvj
S.—Local use.		Whitfield.

LICHEN PILARIS.¹

Description.—Crocker describes, under the name of lichen pilaris, or lichen spinulosus (Devergie) an inflammatory disease of the hair follicles in which a spiny epidermic peg occupies the centre of the papule. It resembles keratosis pilaris somewhat, especially when the inflammation has subsided, but, according to Crocker, although the last-mentioned disease has an epidermic plug, it is not spiny like that of lichen pilaris, and there is no objective redness. Besides, lichen pilaris is not a diffuse eruption, but occurs in acute or subacute crops, arranged in patches on the back of the neck, buttocks, trochanteric regions, abdomen, back of thighs, popliteal spaces, and extensor surfaces of the arms.

¹ See Adamson, British Journal of Dermatology, February and March, 1905, for a full account of this affection.

Treatment.—Alkaline baths, and frictions with the hand while in the bath, are advised as preliminary measures, followed by a liniment of soft soap and tar. Internally, tonic treatment is required.

PITYRIASIS RUBRA PILARIS.¹

Description.—There would seem to be no question that the greater number of cases described as lichen ruber acuminatus are really examples of the disorder now definitely recognized as pityriasis rubra pilaris. The beginning of the disorder is by no means uniform. In rare instances there is an acute onset in which there is a more or less generalized scarlatiniform redness of the skin (erythrodermia), with special localization on the hands and feet, and considerable systemic reaction; these symptoms soon abate, however, and the affection runs its usual indolent course.

In the majority of cases the development is gradual. Sometimes it may begin with the appearance of characteristic papules scattered over the trunk or upper limbs, especially upon the postero-external surfaces of the forearms and on the dorsal surfaces of the phalanges; or again as a dry, scaly eruption upon the palms and soles. It is pointed out that we should regard with suspicion marked and chronic desquamation of the bed of the nail, and the presence of seborrheic scales upon the scalp, redness of the skin of the face, and a pityriasic desquamation of the eyebrows and beard. The characteristic expression of the disease is in the form of acuminate or conical, more rarely round or umbilicated papules. These lesions are pierced by atrophied hairs, which are ensheathed in horny and sebaceous layers that dip down into the follicle. They are

¹ Those interested in the "lichen question" can obtain full information in the standard text-books. The description of the disease here given is largely taken from Brocq's article in the Twentieth Century Practice of Medicine, 1897.

dry, rough to the touch, making the integument to feel like the skin of a plucked fowl, more or less red, but at times brownish or grayish white. The papules are isolated in the beginning, but gradually increase in numbers and eventually run together. The papules are found in those regions where the hair is most abundant, that is, on the first and second phalanges of the fingers, on the outer aspect of the forearms, the outside of the thighs, the legs, the buttocks, but also in the neighborhood of the elbows and knees, about the waist and the inferior part of the abdomen.

After the coalescence of the papules has occurred from increase in number of the lesions, the individual papules are lost in yellowish or brownish-red patches covered with micaceous scales. The skin becomes much thickened, its natural folds are exaggerated, and it assumes a permanent yellowish color. At the borders of the patches it is generally possible to discover the typical conical papule characteristic of the disease, but this is not always easy, and at times the implication of the integument is general.

When the disease attacks the face, as it does in most instances, the skin presents different aspects; at times it is of a dusky red, with much contraction and subsequent ectropion, or it is covered with greasy crusts, or presents a fine desquamation. The scalp exhibits usually a furfuraceous desquamation, but according to Brocq there are no cones surrounding the hair, and the skin is not appreciably red; more rarely there is a marked seborrhea of this region.

The skin of the palms and soles is sometimes greatly thickened, or these surfaces exhibit reddened patches, are dry and itchy, with slight desquamation and an exaggeration of the usual lines and furrows. The nails present diverse appearances, sometimes being marked with transverse furrows or else with longitudinal elevations and depressions; or again they will be thickened. Pain may be present to a considerable degree. Subjective symptoms are said to be absent in most cases, but at times there may

be marked pruritus. It is also claimed by European authorities that the general health of the patient is unimpaired, but we have occasionally seen marked impairment of the general health, and much local distress.

The **etiology** of this disease is obscure. It is said to be more frequent in men than in women, and according to Besnier, while it may begin at any time of life, it is most apt to appear for the first time in infancy or youth. Jacquet has found that the cone surrounding the hair is due to an exaggerated cornification of the epithelial wall of the infundibulum of the follicle.

Prognosis.—The prognosis is usually favorable, but relapses are common.

Treatment.—The results of **internal treatment** are not especially encouraging. Pilocarpine by the mouth or hypodermically will relieve, temporarily, the excessive dryness of the skin. Brocq recommends arseniate of sodium in increasing doses. Hyde and Montgomery have observed marked amelioration of the symptoms from the combined use of arsenious acid, $\frac{1}{10}$ gr., and protiodide of mercury, $\frac{1}{8}$ gr., given three times a day, but these drugs have been employed in connection with local applications. Thyroid extract has been given with some asserted advantage. **Locally**, an antiphlogistic treatment (Leredde) should be employed when inflammatory conditions are present, that is, soothing pastes and ointments.

The following ointment gives much comfort:

R—Acidi salicylici	gr. x
Ol. amygdalæ dulcis	℥ij
Lanolini	℥vj—M.

A salve that is valuable in ichthyosis is also useful in this disease, namely:

R—Adipis benzoati	℥j
Glycerini	℥xl
Vaselini	℥ss—M.

Weak tar ointments are also recommended, but we have found tar objectionable for various reasons. In irritable

states of the skin simple warm baths, to which has been added bran or starch, or vapor baths, prove acceptable. Usually, however, a bath rendered alkaline by the addition of 8 or 10 oz. of carbonate of sodium gives the best results, especially if followed by the inunction of one of the salves mentioned above, or, indeed, of simple vaselin. In more chronic states, pyrogallic acid, chrysarobin, and such remedies may be prescribed as in psoriasis. Strong salicylic plasters may be employed for the thickened patches on the palms and soles. The scalp may be treated as in seborrhea by shampooing with green-soap tincture and the application of a weak salicylic acid salve. Pusey obtained considerable persistent improvement in one case by the x -ray carried to the first degree of reaction.

DERMATITIS GANGRÆNOSA.

Description.—Gangrene of the skin may result from a great variety of causes, local and constitutional; for example, it may follow upon the prolonged or excessive action of heat or cold, from the application of chemical agents, from the internal use of ergot, from shock, and in symptomatic connection with various cerebral and spinal disorders; also, from various changes within the vessels, alterations in the vessel wall, and from pressure. From the clinical standpoint the following types may be mentioned:

Multiple Gangrene of the Skin.—It was formerly held that this type of the disease occurred mainly in young women and was artificially produced, and while this is probably correct for most instances, it has been shown that this is not always the case.¹ The affection has been observed in men and also in children. Lessened tissue resistance and local infection are probably the etiological factors involved.

¹ See especially Van Harlingen, American Journal Medical Sciences, July, 1897.

Diabetic Gangrene.—The gangrene of the skin that sometimes occurs in connection with diabetes may arise spontaneously or follow upon some traumatism, or appear in connection with some one of the cutaneous disorders that accompany the disease. The extremities, particularly the lower, are especially liable to attack, the gangrene being unilateral. The genitalia may also be involved.

Symmetrical Gangrene (Raynaud's disease).—This affection consists of three morbid conditions, probably due to one and the same cause, viz., vasomotor spasm of the arterioles, usually of the extremities, and a consequent retardation of the circulation in the parts attacked. Raynaud divided the disease into three stages as follows: Local syncope, local asphyxia, and local gangrene. The process does not necessarily pass from one stage into another; it may stop short of the extreme stage of the disease, or exhibit other variations in its course. Neither is it always symmetrical, and other parts than the extremities may be attacked, such as the nose, ears, etc. Raynaud's disease is more common in women than in men, and it is frequent between the ages of fifteen and thirty, although it has been observed in young children.

Dermatitis Gangrænosa Infantum.—Gangrene of the skin in young children is of not infrequent occurrence after varicella and other cutaneous affections. Tuberculosis and syphilis are also said to be predisposing influences. It is most common under the age of three years, and consists of superficial or deep ulcerations covered by a slough situated on the site of the original lesion, or it may occur independently. In some cases the patches of gangrene are widely scattered and numerous, accompanied by high fever and leading to a rapidly fatal ending; or there may appear a series of small pustules, each of which sloughs and leaves a small scar with an indefinite prolongation of the disease by successive crops. Microbic infection is highly probable.

Prognosis.—In multiple gangrene of the skin, the prognosis is usually good in the long run; in diabetic gangrene

the outlook, except in some cases of the spontaneous form, is unfavorable; in Raynaud's disease there may be a single attack without relapse, but recurrence is the rule and the prognosis is unfavorable; dermatitis gangrænosa infantum, with numerous lesions and marked systemic disturbance, is a grave disorder, but the prognosis is good in slight cases, and under judicious treatment those of an apparently serious nature get well.

Treatment.—The treatment of the various forms of gangrene of the skin consists in ascertaining and removing the underlying cause of the disturbance, and the maintenance of the general health by appropriate tonics and proper food.

In so-called **multiple or spontaneous gangrene** the general principle of seeking the cause of the complaint should be followed. At the same time it should be remembered that Audry thinks that some of the cases are due to the administration of the iodides or bromides. These drugs should therefore be employed with discrimination.

In **diabetic gangrene** the causative disease must receive proper attention, dietetically and medicinally. Nitroglycerin may be of use. Opium is generally indicated.

The general treatment of **Raynaud's disease** demands close attention to the health of the patient, and it is said that much can be accomplished by preventing exposure to cold, and by securing a good circulation by bathing and judiciously selected clothing. Quinine has appeared of benefit in some cases. Nitroglycerin and erythrol tetranitrate have been recommended in the asphyxial stage. We have tried the former without any very satisfactory results. Raynaud advised the use of a descending galvanic current. If applied to the spine the positive pole is placed in the region of the neck at the fifth cervical vertebra, and the negative at the sacrum and lower lumbar region; or the negative pole may be placed directly over the diseased parts. A strong current is used daily for five or ten minutes. Barlow directs that the affected limb should be placed in a basin of warm water and salt, together

with one pole of the battery, while the other pole should be placed on the member at its upper portion. A current should be used as strong as the patient can tolerate. T. K. Monroe advises the same procedure, except that he uses a low voltage and amperage for one-half hour twice daily. Shampooing is also a valuable adjunct. Faradism has its advocates.

In the **gangrene of infancy** Crocker thinks well of 5-gr. doses of sulphocarbolate of sodium, and quotes Coutts as advising opium. In our opinion opium is an excellent remedy in gangrene from any cause, both for its direct effect and indirectly as a means of relieving pain and quieting restlessness.

The **local treatment** of the various forms of gangrene of the skin is mainly surgical. In gangrene of the skin of children, the sloughs should be removed by antiseptic lotions of carbolic acid, and upon separation the ulcerated surfaces may be treated by aristol or xeroform, either dry or in vaselin. Crocker stops the extension of the gangrene and the surrounding infiltration by subcutaneous injections of carbolic acid 1 in 40, near the sloughing ulcers; if the gangrenous patch is large, three or four injections around it, 3 or 4 minims to each spot, may be necessary.

DERMATITIS MEDICAMENTOSA.

Description.—It is of great importance for the physician to remember that eruptions of the skin follow upon the taking of many drugs; in fact, under certain circumstances any drug may give rise to cutaneous symptoms, although these effects are more prone to occur after the administration of certain remedies than after others; thus, the salts of iodine or bromine, if taken largely and for long periods, will almost invariably produce skin eruptions, while it is an exceptional circumstance for quinine to be followed by any similar disturbance. According to Van Harlingen, these medicinal eruptions occur in fairly well-defined

groups, and are more or less alike in their features. Erythematous, scarlatiniform, and urticarial rashes are the usual types presented; less frequently they are pustular, bullous, nodular, and purpuric. Ulcerative and gangrenous lesions are observed among the untoward effects of some drugs, and it is well known that herpes zoster, keratoses, and pigmentation of the skin are by no means infrequent consequences of arsenical medication.

Treatment.—The treatment of the various forms of drug eruption consists naturally in **suspending the use** of the offending drug; but sometimes it is quite essential to keep on with the latter notwithstanding its evil effects. A number of remedies have been suggested as capable of modifying the action of the bromide compounds, such as arsenic, sulphide of calcium, belladonna, and the aromatic spirit of ammonia. The simultaneous local use of a sulphur lotion is also valuable in preventing bromic acne.

Morrow gives $\frac{1}{100}$ gr. atropine to counteract the effect of the iodides on the nasal and conjunctival mucous membranes, and we are in the habit of prescribing 5 minims or more of the tincture of *nux.vomica* with iodide mixtures. The drug may also be taken in milk, vichy, junket, essence of pepsin, etc.

Unna advises the use of dilute hydrochloric acid and other mineral acids to prevent the poisonous effects of pyrogallol and chrysarobin, thus diminishing the alkalinity of the blood. Netter states that the administration of chloride of calcium prevents serum rashes. On the day of injection he gives 1 gram, and this dose is repeated for the two following days.

The **local treatment** differs in no way from the treatment that would ordinarily be employed for similar rashes due to other causes.

The sometimes very formidable carbuncular (anthracoid) lesions due to iodine or bromine preparations usually do well under soothing and antiseptic ointments, *e. g.*, xeroform, 10 per cent., to unguentum vaselini plumbicum, 1 oz., spread on patent lint; or if this should not prove suit-

able, a bismuth and carbolic acid salve, $\frac{1}{2}$ oz. of the former, 5 to 10 minims of the latter, to 1 oz. of vaselin.

Gottheil recommends a 5 per cent. salicylic acid dusting powder, or paste, as useful in shrivelling up the fleshy excrescences, and, in obstinate cases, curettage under local anesthesia.

DERMATITIS FACTITIA.

Description.—Feigned eruptions or eruptions that have been produced artificially by hysterics and malingerers are far from uncommon, and while their treatment is usually that of the kind of disturbances thus set up, a few words on the general subject may not be out of place. The following points should be remembered in establishing a diagnosis. In the first place we should ascertain, if possible, the history of the patient, moral and physical, and note carefully the present condition; secondly, we should discover if the patient has had any previous skin diseases and whether he had been or was at the time making use locally or internally of any medicinal preparations. We should make a mental comparison of the lesions present with other known eruptions and note any special anomaly. The **shape** of the lesion will often furnish a hint. Finally, it must be remembered that eruptions produced with intent to deceive generally occupy **accessible situations**, and in right-handed people, for example, are apt to be found on the left side of the body.

According to the agent employed, the lesions produced will occur in erythematous or excoriated patches, as, for example, from the application of mustard or rubbing; or they will be bullous or pustular, or present superficial or deep ulceration, or such disturbances as could be caused by acids, croton oil, cantharides, or carbolic acid; or they will consist of scratch marks made by the nails or some instrument; or burns produced by the application of a lighted cigarette; or, finally, of some discoloration of the skin brought about by the use of blacklead, silver nitrate,

etc., or, as in one of our cases, by that of the red pigment used in china painting, to simulate hemorrhage.

Very often an ulceration, for example, that has almost healed under suitable treatment will suddenly become worse under renewed irritation, secretly inflicted, and to expose the trick it may be necessary to put on a bandage in such a way that its disturbance by the patient will be quickly detected. At times the nature of the substance that is supposed to be at the root of the difficulty may be discovered by chemical means.

DERMATITIS TRAUMATICA.

In this group are to be found those inflammatory changes in the skin resulting from traumatism, such, for example, as excoriations and abrasions from scratching, from the pressure of tight or ill-fitting shoes, awkwardly applied bandages, braces, etc. There are marked pigmentation and induration of the skin, when the source of irritation is long continued. The treatment consists in the removal of the cause, and the application of remedies of a soothing character.

DERMATITIS VENENATA.¹

This title is usually accepted as meaning all forms of inflammation of the skin produced by external irritating agencies, whether from the animal, vegetable, or mineral kingdoms. The number of substances capable of exciting this pathological state is exceedingly large, and those liable to such attacks are to be found in all the relations of life. The mineral irritants are numerous, as, for example, the coloring material in wearing apparel, the various chemicals employed in the trades, and the substances that go to make up many of the commercial soaps.

¹ For a full treatment of this subject see White's valuable monograph on *Dermatitis Venenata*, Boston, 1888.

Vegetable Substances.—White has shown that more than sixty plants are to be found in the United States that may give rise to varying degrees of dermatitis. In particular there are four species found in this country that are capable of producing active inflammation of the skin of individuals exposed to their influence, whether from actual contact or mere proximity. These are *Rhus toxicodendron*, Poison Ivy or Poison Oak; *Rhus venenata*, Poison Sumach, Poison Dogwood or Poison Elder; *Rhus diversiloba*, met with on the Pacific coast, and *Rhus pumila*, the most poisonous of all, a procumbent shrub of South Carolina. Pfaff has pointed out the error of Maisch's conclusions in regard to toxicodendric acid, and has shown that the irritant principle is a fixed oil called by him toxicodendrol. The character of the dermatitis from rhus poisoning varies in intensity; sometimes it is merely an erythema, or there are a few scattered papules, or else there supervenes acute swelling of the skin with the formation of vesicles, pustules, and blebs. There are marked sensations of itching and burning. The hands, face, and genitals are usually involved, sometimes the entire surface. The disease may last from one to six weeks. The poisonous principle may be conveyed in an early stage of the affection from one part of the body to another, or, perhaps, to a second person; but according to White, after the poison has been absorbed or removed by washing or volatilization, there is no risk of contagion. The effects of exposure show themselves in from a few hours to several—four or five—days.

Susceptibility to rhus poisoning once established would appear to be more or less permanent.

Treatment.—The treatment of dermatitis venenata should be conducted on general principles, taking care, of course, to rid the skin of the source of irritation as soon as possible. There are many so-called specifics for rhus poisoning, for the reason that the dermatitis varies greatly in degree, and the affection runs a tolerably definite course. Under any circumstances, a method of much value is to wash the affected parts immediately with soap and hot

water. This is to be done freely with a copious lather, and for a considerable time. Balch follows this by washing the part in 95 per cent. alcohol, repeatedly pouring the latter over the surface to dissolve the toxicodendrol. As a medicinal application we have found hourly mopping with sulphate of zinc lotion of the strength of from $\mathfrak{z}\text{j}$ – $\mathfrak{z}\text{ss}$ to water Oj to be of much service. Black wash—calomel $\mathfrak{z}\text{j}$, lime-water Oj —is an excellent application, used as a lotion upon linen, for one-half hour at a time. This should not be used over too extensive surfaces. Preparations of lead are especially valuable, being antidotal to toxicodendrol. With an **unbroken** skin we often use 1 part of lead-water to 3 parts of plain water, and later the unguentum *vaselini plumbicum*. A remedy of universal application is, according to White, made as follows:

R—Zinci oxidi	$\mathfrak{z}\text{iv}$
Acidi carbolici	$\mathfrak{z}\text{j}$
Liq. calcis	Oj —M.

S.—Shake and mop over affected surface repeatedly, day and night.

Klotz has found ichthyol of much value.

Sometimes in limited, very itchy patches, where the papular element predominates, Pick's linimentum exsiccans¹ with 1 per cent. of carbolic acid and 10 per cent. of zinc oxide gives a very satisfactory result. It must be smeared over the parts very thinly and gently. It is readily removed with warm water. In slight cases some form of paste may be recommended.

R—Acidi carbolici	mij
Zinci oxidi	$\mathfrak{z}\text{j}$
Talci	$\mathfrak{z}\text{j}$
Vaselini	$\mathfrak{z}\text{ij}$ —M.

Careful puncture of the large blebs will give much comfort, as will also the occasional washing of the affected parts with a little warm water or a weak alkaline lotion. The washing and subsequent gentle drying may be done with absorbent cotton.

¹ See Section II, Liniments.

ADDITIONAL PRESCRIPTIONS.

R—Sodii hyposulphitis 3j
 Glycerini 3ss
 Aquæ q. s. ad 3viij—M.
 Munro.

R—Extracti grindeliæ fl. f3j-3ij
 Aquæ 3iv—M.
 S.—Apply on cloths. Duhring.

R—Tr. sanguinaræ,
 Aquæ ss 3ij—M.
 S.—Paint on.

DERMATITIS CALORICA.

The effects on the skin of varying degrees of heat and cold are included under this head, as, for example, sunburn, common burns and scalds, frostbites, and chilblains. The clinical symptoms are very similar in these affections, whether the exciting agent be heat or cold, and there may be present all grades of disturbance from simple hyperemia up to gangrene of the skin.¹

Treatment.—The treatment of a burn of the first degree, namely, that condition in which there is redness, heat, and swelling with considerable pain, followed by desquamation, should be of a soothing character. A saturated solution of sodium bicarbonate applied by means of cloths of suitable size is an excellent and convenient remedy.

¹ A not uncommon, but generally unrecognized, form of frostbite, which occurs in very young children, has been reported by one of us. (Hardaway, St. Louis Courier of Medicine, March, 1904.) The parts attacked are the cheeks and the neck under the chin, in other words the regions that are usually uncovered. Upon a superficial examination the affected area presents a fairly well-defined flush looking like an ordinary erythema, but upon closer inspection it will be found that the flush area corresponds to a deep infiltration of the tissues, which upon manipulation gives the impression of an embedded, solid, but circumscribed mass. There is usually some fever and enlargement of the contiguous lymphatic glands. Most of the children attacked have fair hair and skin. The treatment consists in the application of the modified diachylon ointment, stiffened with about 12 per cent. of zinc oxide.

Later on, in the desquamative stage, a soothing ointment may be employed. In burns of the second degree, where blisters have formed, the contents of the blebs may be evacuated, taking care, however, to leave the roof of the blisters intact, as they form the best protection to the inflamed tissues beneath. The carron oil (equal parts of lime-water and linseed oil), to which may be added a small amount of creosote, is probably the best local application. A number of substances, which often lie ready at hand, are useful for first aid; among these are, cotton-wool, flour, molasses, white, lead paint, varnish, common soap made into a thick lather, and mashed potatoes. Fluidextract of hammamelis is good. Lister covered the surface with lint soaked in 3 per cent. carbolized oil; over this he put carbolized gauze covered with rubber tissue or oiled silk, and a bandage. The gauze is changed as often as necessary, but the lint is not disturbed. In burns of the first degree Leistikow uses 5 parts zinc oxide, 10 parts magnesium carbonate, and from 1 to 2 parts ichthyol; in burns of the second degree he applies the following: zinc oxide, 5 parts; prepared chalk, 10 parts; starch, 10 parts; linseed oil, 10 parts; lime-water, 10 parts, and from 1 to 3 parts of ichthyol. Picric acid was originally recommended by Thierry, and has been much used of late. Keen advocates compresses soaked in the normal salt solution.

Continuous immersion in a warm bath is a valuable measure in extensive cases with shock. However, these and profound burns with their complications and after-results rather belong to the province of the surgeon. Opium is always indicated, and, generally, alcohol. The body temperature must be carefully maintained by hot bottles and blankets.

In inflammation of the skin, the result of cold, the patient should be placed in a cool room, and the affected parts should be restored to a normal temperature by being rubbed with snow, or else by the application of cold water. Sloughing and ulceration should be managed on anti-septic principles.

The treatment of chilblains has been given in another place (p. 22).

X-RAY DERMATITIS.

For description of *x-ray* dermatitis, the reader is referred to Part II.

Treatment.—The treatment of the mild grades of *x-ray* irritation is that of erythema in general, viz., soothing lotions, pastes, and salves. We have found the zinc and calamine lotion, with or without a little carbolic acid, an agreeable application. The same may be said of Pick's linimentum exsiccans reinforced with 10 per cent. of zinc oxide. In cases of decided dermatitis, Crocker's liniment thus modified is more suitable:

R—Zinci oxidi	3ss
Pulv. calaminæ præp.	℥j
Liq. calcis,	
Ol. amygdalæ	āā 3j
Lanolini	3jss—M.

S.—Apply on strips of cotton cloth.

Mewborn recommends the following application:

R—Plumbi acetatis	3iv
Aquæ	℥iij
Solve et adde	
Alumen sulph.	3ijss
Sodium sulph.	3ijss
Aquam	Ov—M.

For very sensitive cases, Pusey finds dressings moistened with normal saline solution least irritating, although some of his cases did better with borated cold cream applied on gauze.

For the chronic scaling inflammation of the hands, we have used with some success the 5 per cent. salicylic acid plaster mentioned on p. 93. It should be spread on strips of cotton cloth and bound neatly on the parts affected.

In similar cases with telangiectases, hyperkeratoses etc., Unna recommends bathing the part with a hot decoction of arnica, followed by the application of diachylon ointment.

Deep ulcerations tax one's resources to the utmost. Stelwagon has seen the pain relieved by orthoform in the proportion of 1 or 2 drachms to 1 oz. of excipient, but in several cases under our care nothing has availed short of morphine. Several ingenious methods have been devised. Thus, Bar obtained healing of an ulcer on the abdomen by exposing it for several hours every day to the light of the sun, a box being fitted over the whole abdomen, the cover of the box consisting of a pane of red glass which was two inches from the surface. Belot obtained a rapid result with a red lamp. Freund and Ehrmann obtained relief of pain and speedy cicatrization with a 100 candle-power incandescent electric light, applied for one-half hour at a time. The electric effleuve has been successful, Apostoli using a static machine, and Oudin a resonator for ten minutes, three times a week. Schwartz healed an ulcer of eight months' duration by electric baths, using a weak continuous current. These cases ordinarily require deep curetting or, better, excision, followed by skin grafting.

HEMORRHAGES.

PURPURA.

Description.—Purpura is characterized by the appearance in the skin of variously sized and shaped hemorrhagic lesions that do not fade on pressure. The cutaneous symptoms may be accompanied by bleeding from the mucous surfaces and extravasations into the viscera. According to the form, shape, and other circumstances connected with the cutaneous hemorrhage, the resulting lesions have received certain special designations, as petechiæ, vibices, ecchymoses, etc.

Purpura Simplex.—This is the most trivial of the cutaneous hemorrhages. The general health is often apparently unaltered, although at times some degree of malaise may be experienced, with slight elevation of temperature. The eruption, so to speak, may consist of any of the forms just mentioned, but is for the most part petechial in character, or occurs in bands, streaks, or with a circinate arrangement (Duhring). Any part of the body may be attacked, but the lower limbs perhaps suffer oftenest. The lesions come out in successive crops, and the disorder may be prolonged for a considerable period in this way. Each hemorrhagic spot will last for a week or two, and will undergo the usual changes of color, *e. g.*, crimson, purple, blue, yellow, green, etc. The eruption itself occasions no discomfort.

Purpura Hæmorrhagica.—Hemorrhagic purpura (land scurvy, morbus maculosus Werlhofii) may be said to be a severe form of the simple variety, sometimes, in fact, developing out of it, and adding to its cutaneous features bleeding from the mucous outlets, and in some cases exhibiting extravasations into serous membranes and important viscera. It is usually unaccompanied by rise of temperature, and may develop suddenly; or, on the

other hand, it may be preceded for a short period by headache, loss of appetite, vague pains, lassitude, and other symptoms of indefinite ill-being.

Hemorrhage into the cranial cavity may cause a speedy death, and in the malignant cases the acute loss of blood will more or less rapidly lead to a fatal issue. In other instances the bleeding is more moderate and the patient is, after a season, restored to health; relapses, however, being not uncommon.

Purpura Rheumatica.—The eruption is generally preceded by a varying degree of malaise, and the patient complains of pains in the joints of a rheumatic character, and on inspection the tissues about the joints are found to be somewhat edematous and slightly tender. The hemorrhagic spots, generally petechiæ, appear in a day or two from the beginning of the affection, although in some instances this order is reversed, and the pains in the joints follow after the purpuric lesions. The usual situation of the eruption is on the lower extremities. The cutaneous hemorrhages undergo absorption in the course of time, presenting in the process of involution the various shades of yellow, green, blue, etc. The disorder may subside after one attack, but relapses are not uncommon. Among the rare complications may be mentioned bleeding from mucous membranes, albuminuria, valvular murmurs, or the supervention of purpura hæmorrhagica (Scheby-Buch). Purpura rheumatica is said to occur in young people of both sexes, but especially in young women. There also exists a severer grade of arthritic purpura, in which the eruption is not limited to the lower limbs and the joint affections are more marked, and there are also pronounced gastro-intestinal symptoms, together with lesions of the throat. There may be present besides, urticaria and edema of the skin, and multiform erythema.¹ Henoch and Couty have directed attention to a form of purpura occurring chiefly in children, in which there are rheumatic

¹ See Osler, American Journal Medical Sciences, December, 1895.

pains, intestinal pain and vomiting, and the establishment of considerable edema of the skin.¹

In addition to the forms of purpura considered above, and which have been regarded as idiopathic, there are a large number of cutaneous hemorrhages that are unequivocally secondary in character, viz., the hemorrhages that complicate various infectious diseases, those due to the ingestion of certain drugs (potassium iodide), and those arising from debility, from cardiac affections, etc.

In what may be called the essential purpuras the **etiology** is far from clear. That these various forms of purpura are of an infectious nature is more than probable.

Prognosis.—A guarded prognosis is required in all cases of purpura, as the course and possible complications of even simple cases are not always easy to foretell. It must be said, however, that the simple forms usually terminate favorably, although interrupted by a number of relapses. Purpura hæmorrhagica will very naturally occasion much anxiety, both on account of the possibility of a fatal issue, and also from the fact that cases finally ending in recovery may be prolonged by repeated recurrences.

Treatment.—Mild cases of purpura require no particular treatment of any sort. The careful physician will, as a general principle, always endeavor to get at the cause of the hemorrhage and remove it if possible. In this connection we should remember that purpura is in most cases a symptom merely, and not an essential disease. In simple purpura in children, however, and in cases with mild arthritic symptoms, Osler gives arsenic to the limit of tolerance.

In all grave forms of purpura it is *of the utmost importance to keep the patient flat on his back*. Among the drugs of most repute in purpura may be mentioned turpentine, acetate of lead, dilute sulphuric acid, ergot, quinine, and gallic acid. Nitrate of silver has recently been recom-

¹ We believe that one of us (Hardaway) was the first to demonstrate the existence of the plasmodium malarie in some of these cases. See Manual of Skin Diseases, 1898.

mended, as also chloride of calcium, 15 to 30 gr., three times daily, but not longer than three days at a time, and adrenalin chloride (McGowan). Unna gives the tincture of arnica internally, in the dose of 5 to 15 drops, three times a day. In malarial cases quinine is urgently demanded. Gelatin subcutaneously or by the mouth has also been employed in severe forms of purpura with success. A combination of ergot and iron has usually given us the best results in cases suitable for their administration. In grave cases the ergot should be given hypodermically. The local hemorrhages should be checked in the usual way, that is by astringents, adrenalin, tampons, pluggings, etc. In rheumatic types the salicylates may be administered, and pains in the joints combated by ichthyol or iodine salves, cotton compresses, etc. Constitutional symptoms should be treated on general principles. Tonics, like quinine, strychnine, arsenic, are useful during convalescence. Iron is said to be contra-indicated for fear of producing relapse, but it may be given later. According to Lockwood, if profound anemia should supervene, warmth must be applied to the body, hot applications to the heart, and opium administered in small, repeated doses. The same authority recommends, under similar circumstances, inhalations of pure oxygen gas, and rectal or hypodermic injections of a warm, sterilized saline solution. On theoretical grounds, at least, the administration of calcium salts would seem proper. In a case of the so-called Henoch's purpura, Longley gave a girl, aged eleven years, adrenalin, 2 minims; liq. arsenicalis, 3 minims, every four hours, with marked success.

ADDITIONAL PRESCRIPTION.

R—Ext. flor. arnicæ 3ss
 Ergotinæ,
 Quininæ hydrochlor.,
 Ferri redacti ʒā gr. xlv—M.
 Ft. pil. No. 100.
 S.—Two pills twice daily as a tonic. Leistikow.

HYPERTROPHIES.

LENTIGO.

Description.—Ephelides, or popularly freckles, are small patches of pigment, of a yellow or even blackish color, and varying in size from a pin's head to a split pea. They affect mostly the face and backs of the hands, but are also to be found on the covered parts of the body. A similar condition is observed in an early stage of angioma pigmentosum et atrophicum, and also in aged people. Wilson speaks of congenital cases, but, as a rule, freckles do not develop until the child is of some age—six to seven years—and then continue more or less marked throughout life. Persons of blonde complexion are more subject to freckles than those of darker skin. It is commonly believed that the sunlight, especially in summer, is the immediate exciting cause, and we know that freckles disappear, or at least notably fade in winter; but they also occur on those parts of the body not exposed to the sun's rays, the so-called "cold freckles" which Unna regards as small pigmentary nevi.

Treatment.—As prophylactic measures the wearing of gloves and red or light-brown veils have been suggested. Many remedies have been recommended for the temporary removal of freckles. The following ointment is one of the most successful:

R̄—Hydrarg. ammoniati,
Bismuthi subnitrat̄is 5j
Ung. aq. rosæ 3j—M.
S.—Apply at night.

If the patient is prepared to undergo the confinement and trouble, the shelling of the skin with resorcin paste (see acne) is more rapid, but we should hesitate to advise the procedure. With this same end in view Stelwagon's plan

is safer, namely, wearing constantly for five or ten days a 10 to 25 per cent. salicylic acid plaster, the application being replaced when it loosens. Stevens recommends lactic acid in the proportion of 1 part of the acid to from 5 to 20 parts of water.

Peroxide of hydrogen, pure or diluted, has also been suggested, but we have seen but little practical benefit from it. As is well known, the various patent freckle removers contain bichloride of mercury, but even in the hands of the experienced physician the strong mercurial lotions are objectionable. However, two formulæ containing mercury will be found below.

Some of the "freckle soaps" are useful in mild cases, or they may be used in conjunction with the bismuth and white precipitate salve given above. For the very black freckles we have found it a good plan to touch each one quite superficially with a stiff, fine needle, attached to the negative pole of a galvanic battery.

ADDITIONAL PRESCRIPTIONS.

R—Hydrarg. chloridi corros.	gr. iv-viiij
Tr. benzoini.	ʒij
Zinci sulphatis	gr. xx-xl
Alcoholis,	
Aquæ	q. s. ad ʒiv—M.
S.—External use.	Stelwagon.
R—Hydrarg. chlor. corrosiv.	gr. v-xx
Ammonii chlorid. pur.	ʒss
Mist. amygdalæ amar.	ʒiv—M.
	Bulkley.

CHLOASMA.

Description.—By the term chloasma is understood an abnormal discoloration of the skin occurring generally in patches of brown, yellow, or black, and presenting various shapes and sizes. Chloasma is usually divided into the idiopathic and symptomatic varieties. Idiopathic chloasma is due to external causes, viz., mechanical, chemical,

thermal, parasitic. Symptomatic chloasma may be a sequel of, or accompany, various physiological or pathological conditions of the system, namely, pregnancy, ovarian and uterine diseases, diseases of certain glands (the supra-renal and thyroid), tuberculosis, cancer, lymphoma, leprosy, malaria, syphilis, and is often seen after the long-continued use of arsenic. Chronic constipation and intestinal and gastric fermentation are more frequently the causes of a patchy pigmentation of the face and hands than is usually supposed. Diseases of the liver, while exceptionally accompanied by a limited or diffused pigmentation, more often produce jaundice, so that the term "liver spot" is not well chosen.

Prognosis.—Chloasma is the result of so many different conditions that it is difficult to forecast its amenability to treatment. So far as the type ordinarily encountered is concerned, it may be said that recurrence is common after removal, and, occasionally, the pigmentation is increased; on the other hand, the cause of the discoloration having either spontaneously disappeared or yielded to treatment, the chloasma may also vanish.

Treatment.—The **internal** treatment of chloasma consists principally in removing the condition upon which it is dependent. In all cases of pigmentation of the face and neck, and it is mostly for such blemishes that the dermatologist is consulted, the uterus and ovaries should be examined, as well as the condition of the bowels and stomach.

The result from **local** treatment will depend upon the depth and location of the pigment. The remedies prescribed cause desquamation of the epidermis, in this way removing the pigmented cells. There are innumerable prescriptions recommended for topical use, but we shall limit ourselves to the measures that we have found most practical. Nightly friction with green soap is often beneficial, or the white precipitate and bismuth salve, given under freckles, may be applied at night and washed off in the morning with the tincture of green soap, which latter

consists of equal parts of alcohol or cologne and green soap. If a more decided effect is desired, the various scaling processes may be tried, but it is a safe plan to feel one's way with weak preparations at first. Among the preparations recommended may be mentioned resorcin in from 10 to 20 per cent. solution in alcohol, or in paste, and salicylic acid. Galloway says that the last-named drug in plaster, plaster-mull, or paste form applied for twenty-four hours at a time, or as a saturated solution in alcohol, applied repeatedly for several hours, is one of the safest and most efficacious remedies for extensive patches. This is our own experience, but we should always give the preference to the bismuth and white precipitate salve for first trial. We have the idea, moreover, that the rapid removal of the pigmentation is more apt to be followed by return of the discoloration than when the slower methods are employed.

Corrosive sublimate in various strengths and combinations is in common use. Bulkley, for example, advises the following:

R—Hydrarg. chlor. corrosiv.	. . . . .	gr. ij-xij
Zinci sulphatis,		
Plumbi acetatis	. . . . .	ʒss
Aquæ destillatæ	. . . . . q. s. ad	ʒiv—M.

S.—External use, night and morning.

J. C. White sometimes prescribes this combination:

R—Hydrarg. chloridi corrosiv.	. . . . .	gr. vj
Acidi muriatici diluti	. . . . .	ʒj
Glycerini	. . . . .	ʒj
Alcoholis,		
Aquæ rosæ	. . . . .	ʒss
Aquæ destillatæ	. . . . .	ʒiv—M.

S.—Apply at night and wash off with soap and water in the morning.

Peroxide of hydrogen, pure or diluted at first, is also recommended. It should be applied on cotton and allowed to remain on the spot several minutes. This procedure may be repeated several times a day. We do not regard this method as of much value.

Small areas may be removed by electrolytic puncture, taking care that the needle should be inserted very superficially. (See Lentigo.) Trichloracetic acid barely brushed over the surface, and not allowed to run over the contiguous skin, and carbolic acid similarly employed, are useful in limited patches. In all the text-books Hebra's rapid method of removing chloasma with strong lotions of corrosive sublimate is referred to and recommended. We have seen the most mischievous results from this practice and would earnestly warn against its adoption.

ADDITIONAL PRESCRIPTIONS.

R—Ammonii chloridi	3ss
Aq. cologniensis	3j
Aquæ destillatæ	3viij—M.
S.—External use.	J. C. White.
R—Hydrarg. ammoniati,	
Sodii boracis	aa 3ss
Ol. rosmarini	gtt. x
Ung. simplicis	3j
S.—Local use.	Kaposi.
R—Bismuthi chloridi	3j
Hydrarg. subchloridi	gr. ½
Hydrogen peroxidi (10-vol. sol.)	3j
Adipis lanæ,	
Vaselini	aa 3iv—M.
S.—External use.	Unna.
R—Hydrarg. chlor. corrosiv.	gr. ij
Tr. benzoin	3ss
Emuls. amygdalæ	3j—M.
S.—External use.	Duhring.

TATTOO MARKS AND POWDER STAINS.

Tattooing consists in the introduction of some insoluble pigment into the upper layers of the skin so as to form a patriotic, religious, or erotic design, or letters, usually the wearer's initials or a feminine name. India ink, gun-

powder, or indigo are used for the blue colors, and carmine or cinnabar for the red. These preternatural adornments are usually acquired in youth. Later the wisdom which sometimes comes with age, the achievement of an improved social position, or marriage, may make their possession an embarrassment and their removal desirable.

Powder stains differ only in the absence of design in their production and execution. They are more often about the face, where they sometimes form a serious disfigurement.

Treatment.—Tattoo marks several inches across may be treated by excision followed by grafting. Smaller marks may be removed by the cutaneous punch or electrolysis. The method by scarification followed by the application of papoid or caroid has been an absolute failure in our hands. Cauterization is efficient, but leaves an undesirable scar. Brault, after thorough cleansing of the surface, tattoos in a solution of 30 parts of zinc chloride in 40 parts of water. This excites a superficial destructive inflammation. Variot rubs on a concentrated solution of tannin; this is then tattooed in. The silver stick is then rubbed firmly on, and after a few minutes' interval the surface wiped off. There is inflammation and a crust forms, which comes off in a week or two.

Powder Stains.—Treatment varies according as the case is seen within a few hours after the accident or later. Within the first twenty-four hours or so a number of the grains can be picked out with a blunt knife point or small curette. We employ the minute instrument designed for the ophthalmologist. Many grains will already have disintegrated into a thickish, inky fluid which can be washed out, together with some still solid particles, by a forcible stream from a hypodermic syringe. Crile, Rhoads, and Clark advocate the use of hydrogen peroxide solution kept constantly applied on lint. A white zone forms around and under the powder grain, which may then be easily lifted out. If any considerable part of the face is involved, the best procedure, within the first twelve hours, is the following: The patient is placed under a general anesthetic

and the surface thoroughly scrubbed with a nail-brush, frequently stopping to douche off the surface and clean the brush. Of course, strict aseptic precautions should be employed. A simple dressing must be applied for the next several ensuing days. The day following the accident there may be so much inflammatory reaction as to interdict further attempts to dig out the grains. After the first two or three days, such attempts will be useless, as the black specks no longer indicate the presence of grains, these having disintegrated, but are henceforth due to staining of the tissues. We may, therefore, as well await the subsidence of inflammation, and then proceed as with tattoo marks. The only successful methods are those directed to the destruction of small portions of tissue, and of these electrolysis has been most satisfactory in our hands.

A much less heroic, and sometimes very successful method, in recent cases, consists in applying on strips of cotton cloth a 5 per cent. salicylated soap plaster (see formula on p. 93) to the affected region, the whole being kept in place by a suitable bandage. After about twelve hours a large number of the powder grains can be scraped away with a blunt curette. These applications, which are also soothing to the inflamed skin, may be repeated for several days in succession. If the skin is very acutely inflamed, the unguentum vaselini plumbicum may be applied in a similar manner for the first day, and followed later by the plaster mentioned above.

KERATOSIS PILARIS.

Description.—The disease known as keratosis, or lichen pilaris, is characterized by the presence of numerous, small, papular elevations seated about the mouths of the hair follicles. The disorder occurs almost exclusively on the outer surfaces of the arms and thighs, and is made up of small, whitish, or dirty-looking papules often pierced by a hair; but sometimes when the horny accumulation has

been picked out, the hair may be seen coiled up under it. At times the papules are quite red, and here and there pustules may be observed. Usually the intervening skin is normal, but at times rough and scaly. Considerable pruritus is present in some cases. It is most common in the winter season.

Brocq divides keratosis pilaris into several varieties according to the color, intensity, and location of the lesions. He also describes a keratosis pilaris of the face which terminates in interfollicular atrophy.

People who are chary in the use of soap and water are the usual sufferers from keratosis pilaris; but it should be well understood that many perfectly clean persons develop this trouble after puberty, and that it is a common accompaniment of ichthyosis.

Treatment.—In cases due to uncleanness, vigorous use of soap and water will speedily effect a cure. Hyde and Montgomery recommend daily cold or saline baths, followed by brisk friction, systematically carried out for years. In other instances the plan suggested for ichthyosis, viz., hot alkaline baths, or warm baths with green soap frictions, preceded and followed by inunctions of bland salves, will give the best results. In poorly nourished persons, cod-liver oil, arsenic, and iron are useful adjuncts to the local measures.

KERATOSIS PALMARIS et PLANTARIS.

Description.—Aside from the familiar callosities affecting the palmar and plantar surfaces, and due to external pressure, there are a considerable number of affections characterized by hypertrophy of the horny layer of those parts, although possessing a widely varied etiology.

The horny thickenings occurring in connection with eczema, psoriasis, and syphilis, are well recognized. Less common are the warty growths following the ingestion of arsenic and usually associated with hyperidrosis. The

papules form first around the sweat orifices, but after a while the intervening spaces become involved and a general thickening takes place. Many cases of tylosis are congenital, and it may appear in several generations and attack several members of a family.

Under the name of **keratoderma erythematosa symmetrica**, Besnier describes a case in which there was a symmetrical thickening of the horny layer, disposed in islets on the palmar surfaces of all the fingers and toes, and on the prominences of the palms and soles. The skin between the hyperkeratotic lesions was healthy and was separated from the diseased parts by an erythematous zone of from 5 to 6 mm. in breadth.

As an **erythema keratodes**, Brooke has described a defined, chronic erythema of the palms and soles which was followed by a superficial hyperkeratosis, associated with tenderness and edema. It recovers readily under treatment, but is prone to relapse.

Treatment.—In the way of **internal treatment**, arsenic, ichthyol, and pilocarpine have been advised by some authorities, but the efficacy of such treatment seems to us doubtful.

Local measures, however, are capable of giving at least temporary relief, and should consist of such keratolytics as salicylic acid, resorcin, etc. A salicylic acid plaster 10 to 20 per cent. strength, or a solution of the same drug in flexible collodion, $\frac{1}{2}$ drachm to 1 oz., generally suffices to remove the thickened epidermis. After the removal of the horny plates the skin is left very sensitive, and as a matter of relief, as well as in the hope of delaying a recurrence of the process, we order a 5 per cent. salicylated soap plaster, spread on cotton cloth, to be worn constantly. Sometimes the emol keleet ointment (see p. 115) serves a better purpose.

Several instances of relief and apparent cure have been reported as the result of the application of the *x*-rays. Zeisler has witnessed a cure in three cases by this method. Stelwagon has also had good results. It is possible that

some of these cases have the same etiology as callus, viz., malposition of the feet, in which case the treatment would be obvious (*q. v.*).

KERATOSIS SENILIS.

Description.—Among the various changes incident to the old age of the skin, the most common and the most important are the presence upon the integument of freckle-like lesions, brown or yellowish brown in color, pea-sized or larger, covered with greasy scales or crusts; and the more distinctly keratotic patches which are somewhat elevated and covered with a thick, rough, horny layer. Epitheliomatous degeneration often occurs as a sequel to these conditions. The face and backs of the hands are the usual sites of these changes in the skin, and, as a rule, they make their appearance somewhat late in life, but often the skin suffers a premature senility, which is not shared by the body in general.

Treatment.—Anointing the parts with an indifferent salve overnight, and washing it off in the morning with a bland soap like the emol keleet, is usually sufficient treatment for the slight seborrhoic patches. The use of irritants and caustics is to be deprecated. If the coating over the lesions be rougher and more adherent, a 5 per cent. salicylic soap plaster (see p. 93), spread on cotton cloth, and worn at night, or in some cases constantly, gives good results. Rohé was the first to call attention to the value of salicylic acid and sulphur, in the form of a paste, to be applied after the removal of the crusts or scales:

R—Acidi salicylici	gr. x-xxx
Sulphuris præcipitati	5ss
Pulv. amyli	5ss
Ung. aq. rosæ	5j—M.

S.—Apply in a thin layer.

D. W. Montgomery, Stelwagon, and others recommend an ointment of sulphur and salicylic acid 10 to 40 gr. each

to 1 oz., which is to be rubbed in gently at night, or morning and night. We generally make use of these remedies after the patient has worn the plaster for some time, taking care, however, to see that the surface to which the lead has been applied is quite free of that drug before applying the sulphur.

Another combination that is useful at times is the following:

R—Resorcini	gr. v-x
Sulphuris præcip.,	
Zinci oxidi	aa 3ss
Pulv. amyli,	
Vaselini,	
Lanolini	aa 3j—M.

S.—Apply in a thin layer.

In considerably developed patches, that is, the true senile wart, it is recommended to use salicylic acid ointments, plaster mulls or collodions, in the strength of 10 to 25 per cent. After the removal of the thick covering by these means, the milder pastes and salves mentioned above may be again employed. According to Sabouraud, these lesions improve greatly under the influence of reducing ointments containing chlorates:

R—Potassii chloratis	gr. xxiv
Sulphuris præcipitati	gr. xlviij
Resorcini	gr. xvj
Vaselini	3j—M.

As a rule, however, we think that these palliative measures are useless, and we know that they are sometimes harmful, and the wisest course is to let these growths alone, or else, if they appear threatening, or occupy situations especially prone to traumatism, to destroy them completely by electrolysis. We have used electrolysis in this way for more than thirty years and have been almost invariably satisfied with the results.

In the common wart it is only necessary to pass the needle superficially, but in these cases the instrument—a stout one—must be repeatedly passed deeply under and through the growth and some distance on all sides of it.

Every one familiar with the therapeutic uses of the *x*-ray has noted the disappearance of these lesions while contiguous areas were being rayed for epithelioma. Pusey reports that in some of his cases so treated improvement has remained for as long as four years.

When an apparent malignant degeneration has occurred the treatment is that of epithelioma (*q. v.*).

KERATO-ANGIOMA.

Description.—This affection, first described by Cottle and more fully by Mibelli, occurs usually on the hands and feet of young persons, the subjects of chilblains, and consists of warty growths that are developed over dilated vessels. The usual situations of the disorder are the dorsal surfaces of the fingers and toes, but, exceptionally, other localities may be invaded. The lesions are minute, red or violet spots, which may be made to disappear under pressure. Among them, in the course of time, are to be noted larger capillary varices, which can be made to pale by pressure, but from which the blood cannot be entirely emptied. The superimposed horny layer becomes thicker, but retains its transparency, showing the vascularity beneath, and the lesions have otherwise the appearance of an ordinary wart. These angiokeratomas are sometimes discrete and sometimes arranged in clusters.

Treatment.—The treatment is by electrolysis.

POROKERATOSIS.

Description.—This rare disorder is a non-inflammatory hypertrophy of the epithelial structures of the skin that begins as warty or callous spots of different sizes and shapes. These presently become depressed in the centre, while slowly spreading at the periphery, until there results a serpiginous seam or “dike,” enclosing areas of varying extent. The ridge

or seam may be continuous for considerable distances, or it may be interrupted in places, and also sometimes exhibits conical elevations along the crest. The enclosed areas may be atrophic and hairless, or else of normal appearance. The surface of some of the enclosed spaces is at times covered with scattered horny bodies. The usual sites of predilection are the backs of the hands and feet, then the rest of the extremities—the face, neck, and scalp. It spreads with extreme slowness, in many instances remaining in the same situation for years. The disorder usually begins between the second and eighth years, but a later development at twenty-six has been observed.

Porokeratosis is a family disease, that is, it appears in parents and offspring, brothers and sisters.

Treatment.—Excision of the lesions has been practised with satisfactory results, but scarring has ensued; on the other hand, electrolytic destruction has been just as successful, besides, as would be expected, producing a much better cosmetic effect. The *x*-rays would probably serve still better.

CALLOSITAS.

Description.—Callosities are thickenings of the epidermis which may be congenital, but are usually acquired as the result of local irritation. The most frequent sites for callosities are the palms and soles. The skin is usually thickened over some bony prominence, as the metacarpophalangeal joints. The lesions of callositas are of various sizes, rounded in outline, slightly raised above the general level, yellowish or brownish in color, and hard to the touch. The entire alteration occurs in the horny layer of the epidermis.

Callus on the palms is usually the result of pressure sustained in the occupation of the affected person; but on the soles, while there are a number of factors involved, such as ill-fitting shoes, etc., one of us has recently called

attention¹ to the frequency with which callus in this situation is associated with malpositions of the feet, that is, weak-foot, flatfoot, or anterior metatarsalgia (Morton's foot).

It is well known that callus and warty growths are not uncommon concomitants of hyperidrosis, and in many instances, at least, the hyperidrosis is the first symptom of the relaxed condition of the foot.

Treatment.—In the cases where a moderate amount of callous epidermis has been produced by the occupation of the patient, it is unnecessary to remove it, as it acts as a protection to the tender layers beneath. In any case, to cure the condition, it will be necessary to remove the cause. In a considerable number of cases of callus of the soles there is no doubt that the malposition of the feet, as stated above, is mainly responsible, and certainly it is a safe rule carefully to examine them, or better still, to refer such patients to an experienced orthopedic surgeon. Dr. Nathaniel Allison,² of St. Louis, to whom we have referred many such cases, makes the following statement: "The method of treatment that I have used, and which in the above series of cases has afforded relief in each instance, has been the ordinary methods employed for the treatment of Morton's metatarsalgia or for weakened or collapsed longitudinal arch. The employment of steel plates as supports, I have found not to be suitable to every case. The method of support supplied has been a small convex felt pad placed under the anterior arch, with its point of greatest convexity at or near the centre of the callosity, or a celluloid or steel plate. In the treatment of the longitudinal arch, it was found that a slight modification of the sole of the shoe was sufficient in some cases to relieve the painful symptoms, whereas others have required a strong steel support. These various methods, coupled with exercise and massage, have afforded entire relief in the majority of cases."

¹ Warty Growths, Callosities and Hyperidrosis, and their Relation to Malposition of the Feet. By W. A. Hardaway and N. Allison, *Journal of Cutaneous Diseases*, March, 1906.

² See article quoted above.

As to the local treatment of the callus itself, the best and simplest plan is to remove the horny layer by the application of a salicylic acid plaster, 10 to 20 per cent., or by painting on a solution of salicylic acid in collodion:

R.—Acidi salicylici 3ss
 Collodii 3ss—M.
 S.—Paint over callus.

If the callus is very painful it may be first poulticed or soaked in oil, or a 5 per cent. salicylated soap plaster may be applied to it, the plaster being spread on thick cotton cloth. (See p. 93.) It is safer to avoid the applications of liq. potassæ, lactic acid, etc., usually mentioned in the text-books.

In callosities of the feet complicated with hyperidrosis, Pusey has found the *x*-rays very satisfactory.

CLAVUS.

Description.—A clavus or corn is a circumscribed thickening of the epidermis which grows in depth as well as superficially. Corns are most often found where pressure occurs on the toes. Corns are hard or soft, according to whether they are in a situation where they are dry or moist. Hard corns occur mostly on the outer side of the little toe and upon the tops of the toes, while soft corns are most common between the toes. A corn may become acutely inflamed and suppurate, leaving a painful ulcer.

Treatment.—In the treatment of corns the first thing is to remove all injurious pressure from ill-fitting shoes. The thickened epidermis should then be removed, after soaking in hot water, with a sharp knife. Another way to effect the removal of the corn is to apply salicylic acid, either in the form of a plaster or in collodion, 1 drachm to 1 oz. The corn should then be neatly strapped with rubber plaster, or a felt ring may be worn over it. The soft corn should be removed as above recommended, and the base touched with some mild caustic; after this the feet should

be washed every day with soap and water, and bits of absorbent cotton pushed in between the toes to keep them apart.

Stelwagon thinks well of lactic acid. Zeisler removed sixty soft corns from one foot by the x-ray.

CORNU CUTANEUM.

Description.—Cutaneous horns are essentially agglutinated warts (Kaposi). They may appear in any region, but are commonest about the face, scalp, and penis. They may develop from sebaceous cysts, warts, or scars. They vary in size from one to several inches, and often bear a close resemblance to the same outgrowth in animals. Sometimes a cancerous degeneration takes place at the base of cutaneous horns.

Treatment.—After the excrescence has been removed by the knife, scissors, or by electrolysis, it is necessary to cauterize the base to prevent recurrence.

Scholtz secured the disappearance of a cutaneous horn with one moderate irradiation. Belot had a good result with two rayings a fortnight apart, using 10 H. the first time and only 3 the next.

VERRUCA.

Description.—The verruca, or wart, has been divided into several clinical varieties depending upon its form or other features: *Verruca vulgaris*, *verruca digitata*, *verruca plana*, *verruca filiformis*, *verruca acuminata*, etc. Warts may occur singly or in numbers; they may be discrete or confluent; and, as will be presently noted, they may have a variety of shapes and sizes, and vary considerably in consistency and other physical characters. Warts are most frequently seen on the hands, face, neck, and genital region.

The **common wart** is too well known to need description, but from the point of view of treatment the physical features of several of the less common varieties of wart may be briefly mentioned.

Verruca Filiformis.—These thread-like or filamentous offshoots from the skin, are mostly seen on the necks of elderly persons. The term *acrochordon* applied to it by some writers is objectionable inasmuch as it is also given to a stage of the fibromatous process.

Verruca Senilis.—These localized hypertrophies appear as flat, dry, freckle-like collections of scales, occurring mostly on the backs of the hands and upper part of the face. They may also be found on the trunk, forearms, and feet. When fully developed they attain considerable height—perhaps one-eighth of an inch, and consist of blackish, cornified scales, which, when removed, reveal a slightly bleeding surface.

The patch is often greasy to the touch. This condition constitutes the seborrheic wart of Unna and Pollitzer.

This affection gains considerably in importance when we remember the frequency with which *keratosis senilis* undergoes malignant transformation, being often in fact the starting point for *epithelioma*.

Verruca Plana Juvenilis.—As its name indicates, this form of wart occurs in young people, and it is observed mostly on the chin, cheeks, forehead, and backs of the hands. In size they vary from a pin's head to a French pea; are usually the color of the skin or somewhat grayish, occasionally reddish, and are only slightly elevated. In shape they are round or polygonal and sometimes strongly suggestive of *lichen planus*. Leredde states that they are auto-inoculable.

Prognosis.—The ordinary wart is benign in character and, as is well known, of an erratic disposition. The so-called seborrheic wart of old people should always be held under suspicion. The *verruca plana juvenilis* is obstinate, but usually disappears in time. Acuminate warts get well under proper management.

Treatment.—Colrat claims that sulphate of magnesium given for some time in doses of 30 gr., three times a day, for adults, will cure warts. Among other internal remedies may be mentioned arsenic, tincture of thuja, nitromuriatic acid and lime-water. Never having tried these drugs, we have no experience in their use.

A great many methods for the local treatment of warts have been advised. The best local treatment is, we believe, by electrolysis, and it is to be remarked that the electrolyzation need not go on to complete destruction, but that often merely transfixing the wart with the needle is sufficient. In young children, who will not submit to the slight pain of this operation, painting the wart with a saturated solution of salicylic acid in alcohol will generally suffice. The salicylic acid in traumaticine or collodion (℞—Acid salicylic, ʒss; ext. cannabis indicæ, gr. v; collodii, ʒj—M.), or in the form of Beiersdorf's plaster is still more effectual. Whitfield mentions resorcin 10 per cent. in plaster or collodion. The various caustic applications, such as the acid nitrate of mercury, caustic potash, or nitric, chromic or trichloracetic acid, may also be employed for destructive purposes, but the methods already mentioned are safer and better.

In case, however, it is determined to use a caustic, and the trichloracetic acid is the only one we should recommend, the skin surrounding the wart should be thoroughly protected from injury by a ring of wax, and the remedy cautiously applied by means of an appropriate applicator.

The filiform wart may be removed by electrolysis or by the application of the minutest quantity of trichloracetic acid, taking care to shield the contiguous skin.

The treatment of the flat wart (*verruca plana juvenilis*) is by no means easy. Electrolysis does not act as well as in the common wart, but it may be tried. The needle, a very fine one, should be introduced no deeper than the level, if so deep, of the skin, and then reintroduced at several different points. A very mild current should be employed. Trichloracetic acid is of some value if used properly. A

good plan is to wrap about the point of a very fine wooden tooth-pick the merest fragment of absorbent cotton, so as to avoid taking up too much of the acid, and with this barely to moisten the warts, seeing also that the application does not trespass on the unaffected skin. We may remark, in passing, that either the deep or the superficial action of trichloroacetic acid may be secured by the manner of its use. If a light effect is desired, the acid should be merely dropped on the part to be treated; if a more or less profound effect is desired, then the acid is more or less vigorously rubbed in. Stelwagon has had good results from a 5 or 10 per cent. sulphur or calomel ointment, and Davis, from a saturated solution of boric acid with from 2 to 10 or 15 gr. of resorcin to 1 oz., while both he and Hyde speak well of the local use of Vleminckx's solution.

The x-ray has been used with success by Varney, Belot, Scholtz, and Holzknecht. The latter gives 8 H. at a single sitting. In a case of abundant warts on the hands, he protected the sound skin with mercurial plaster, in which apertures were cut corresponding to the warts. The nails were covered with lead. Kothe, of Bonn, achieved a cure by injecting a 1 per cent. solution of eosin into the warts before raying.

Bulkley advises sparking with the high-frequency current, using a glass or carbon-pointed electrode.

Acuminate warts, or vegetations, should be washed with some disinfecting lotion, such as a solution of permanganate of potassium or dilute liquor sodæ chloratæ, then thoroughly dried, and afterward dusted with boric acid, resorcin, calomel, or oxide of zinc and lycopodium in equal parts. In some cases the galvanocautery offers the speediest and best method of treatment.

Verruca Senilis. (See Keratosis Senilis.)

For **papillary growths** on the sole the usual treatment by salicylic acid, caustics, curettage, etc., may be tried; or Fitz's method may be followed, which consists of the application, daily or twice a day, of a 10 per cent. chrysarobin solution in traumaticine or ether. In this condition, as in

callus, we should, by all means, advise that the anatomical condition of the foot be ascertained. We have seen intractable conditions of this sort cured by treatment directed to the collapsed arch.

ADDITIONAL PRESCRIPTIONS.

R—Glycerini	℥jss
Acidi acetici diluti	℥ijss
Sulphuris præcip.	℥j—M.
S.—For small, multiple warts.	Morris.
R—Potass. chloratis	gr. xxiv
Sulphuris præcip.	gr. xlviij
Resorcini	gr. xvj
Vaselini	℥j—M.
S.—For senile warts.	Sabouraud.

NÆVUS PIGMENTOSUS.

Description.—A pigmented nævus, or mole, is a deposit of pigment in the skin. A mole may consist of a circumscribed hyperpigmentation only, or alterations in other elements of the skin may be present, constituting nævus verrucosus, when the surface is rough and warty, or nævus pilosus, when there are hairs growing from the mole. When a mole is loose, flabby, and contains fatty tissue, it is spoken of as nævus lipomatodes.

Pigmented nævi are most common on the face, neck, and back. A number of nævi are sometimes arranged in a line or band; this is found only upon one side of the body, and has, therefore, been called nævus unius lateris.

Moles are always congenital in origin, although they may not become apparent until later life.

One of the most important facts connected with moles is that late in life, if irritated, they not uncommonly form the starting point for malignant growths.

Treatment.—Electrolysis is the best method of removing moles when small. Since moles are removed mainly for cosmetic reasons, it is important that the operator should

not produce more disfigurement than the growth itself occasions. Consequently, the electrolysis should be done little by little, and with an interval of some days between each operation, in order to take stock of the result, as it were. We usually employ a fine sewing needle, and endeavor to pass it very superficially through the growth in the beginning. Later on, after the effect of the operation has worn away, little irregularities can be smoothed down at one or more sittings. Hairs, when present, should first be removed by the same agent. Larger growths may be dealt with by caustics or the galvanocautery. Hearn shaves off the superficial layer of simple, flat pigmentary *nævi*, as in making a Thiersch graft. Prominent, deeply pigmented moles are best and most safely dealt with when excised. When the growth is irritated, no other method should be considered.

Pusey obtained a most gratifying result by the *x*-ray in a disfiguring case, situated on the forehead. Hairs sprung from a rough, pigmented surface. The cure left the skin smooth, only a little darker than normal.

Trimbell and Dade destroy the growth, a part at a time, by rapid freezing with liquid air. Pusey does the same thing with solid carbon dioxide.

ICHTHYOSIS.

Description.—This affection, popularly known as fish-skin disease, is apparently dependent upon the transmission of an hereditary tendency, and appears first in early childhood. It is characterized by general scaliness and unusual dryness of the surface, or the development of plates separated by fissures.

The milder grade affects the surface generally, but is most developed on the extensor aspects of the limbs. In many cases there is present simply an unusual dryness and roughness of the skin. Associated with this thickened and scaly state of the epidermis, there is always present more or

less of a papular eruption due to accumulation of horny cells in the hair follicles, keratosis pilaris.

In a severer grade of ichthyosis the skin is rough, thickened, fissured, and scaly. The plates of skin are usually diamond-shaped, bearing a close resemblance to the markings observed upon the hide of the alligator; but the physical characters of the scales will differ somewhat according to the locality, etc. The scaling sometimes occurs in thin, papery flakes, or it may be thick and horny.

The thin portions of the skin, face, palms, scalp, soles, and flexor surfaces generally are but little affected, but the hair is apt to be harsh and lustreless, and the nails, rough, pitted, and easily fractured. There is almost complete absence of perspiration, and the sebaceous secretion is deficient and altered. Itching is sometimes present in a mild degree, and the deep cracks in the skin may occasionally be very painful. Owing to the increased activity of the glands in summer, and the consequent softening and shedding of the epidermal accumulations, ichthyotic patients improve greatly at this season, and the lighter forms of the disorder may even entirely disappear. The general health is not appreciably affected.

The term **ichthyosis hystrix** may be properly applied to cases in which the scales show a horny excrescence. Most of the cases described by this title are not ichthyosis at all. Many of them are probably instances of *nævus unius lateris*. So-called **congenital ichthyosis**, designated in extreme grades as "harlequin fetus" is really an independent condition, better called **hyperkeratosis congenita**.

Prognosis.—Ichthyosis is an incurable disorder, but by persistently bathing and anointing the skin the patient may be kept tolerably comfortable. Temporary disappearance of the ichthyosis has been sometimes noted after severe illness; and Hebra reports two permanent cures, in one case after an attack of measles, and in another following smallpox. All but the mildest case of so-called congenital ichthyosis are either stillborn or perish within the first few days of life.

Treatment.—Within the last few years we have been in the habit of administering two or three of Garrod's sulphur tablets a day in some mild cases of ichthyosis or xerosis, and it has seemed to us that the result was good. We should mention, however, that there was carried on a simultaneous local treatment. David Walsh has prescribed with benefit a tablet containing 5 gr. thyroid extract and $\frac{1}{10}$ gr. nitrate of pilocarpine; cod-liver oil is sometimes of service. In mild cases the free use of simple warm baths, followed by inunction of glycerin or lanolin diluted with cold cream, will keep the skin tolerably smooth and pliant. Vapor baths are also helpful. In cases of greater severity it is advisable to render the baths alkaline by the addition of 8 to 10 oz. of carbonate of soda. Duhring and Stelwagon recommend that some mild ointment be first rubbed in and allowed to remain on a few hours, and then followed with a hot bath and green soap washing, which in turn is to be rinsed off with simple warm or hot water, and then again the surfaces are to be anointed with the salve. The following preparations are recommended:

R—Adipis benzoati	℥j
Glycerini	℥xl
Vaselini	℥ss—M
S.—Apply after bathing.	
R—Potassii iodidi	℥j
Glycerini	℥j
Adipis benzoati,	
Olei bubuli	℥ā ℥ss—M.
S.—Apply once daily.	

This latter preparation is highly commended by various authorities. Naphthol in 5 per cent. ointment, together with the use of naphthol soap, is regarded favorably by Kaposi. Andeer has used a 3 per cent. resorcin salve with asserted success. Sulphur of the strength of 1 drachm to 1 oz. of lard or vaselin has recently been brought forward. It is also recommended to impregnate the garments with its fumes every few days. A scruple of salicylic acid to 2 drachms of oil of sweet almonds and 6 drachms of lanolin is also valuable in conjunction with warm alka-

line baths. Walker recommends a 5 to 10 per cent. ichthyol ointment. Duncan observed improvement in one case with the x-ray.

SCLEREMA NEONATORUM.

Description.—The disorder may be present at birth, but in this case the children are usually stillborn. As a rule, sclerema develops in the first few days of life. The skin of the lower extremities is first affected, and later successive portions of the integument until the whole surface is involved. At times the induration begins in the cheeks and spreads downward. In the beginning the skin is of a waxy appearance, and feels thick when pinched up; later it has a livid hue, becomes adherent, and can no longer be rolled between the fingers. After the disorder has become fully established, the body is rigid, with only such movement as arises from the shallow breathing, the joints are fixed, the child is unable to nurse, and the whole body is so stiff that it can be held out horizontally by the legs. The respirations are slow and superficial and the pulse falls to sixty or below. The temperature is also subnormal, and in a few days life is extinguished.

Treatment.—The treatment should be directed to bringing the temperature up to the normal, and to this end the child should be wrapped in cotton, or, if practicable, put in an incubator. Nourishment and stimulation should be administered by the rectum, or by feeding with a catheter. Money reports two cases of recovery under the use of inunctions with mercurial ointment, and Garrod has had a similar experience.

ŒDEMA NEONATORUM.

Description.—This affection begins within the first three days of life. The edema spreads from the lower limbs upward, affecting the hands and genitals. The skin is

pale or livid and pits upon pressure. The child may recover from this condition, but in other cases the edema may become general, the skin red or darkish yellow and very hard to the touch, respiration becomes difficult, the pulse weak, and the child succumbs to some pulmonary, intestinal or cerebral complication.

Treatment.—The treatment consists in raising the body temperature by artificial means, frictions from below upward, and proper feeding.

SOLERODERMA.

Description.—Clinically, this affection is characterized by a hardening or rigidity of the skin. In the diffuse form a considerable portion, or even the entire surface of the body, may be involved. It may make its appearance in any region, but, nevertheless, has a decided preference for the upper portion of the body. It has a tendency to spread over extensive areas and is usually symmetrical. The attack may be preceded by pain in the joints, a chill, edema, or abnormal sensations in the part, but frequently it comes on unheralded and insidiously, and the patient only becomes aware of the change when the induration is already marked, and the pliability of the integument destroyed or, at least, seriously impaired. When fully developed, the skin is tense, infiltrated, hard, and to the touch gives the impression of a frozen cadaver, without the feeling of coldness. It does not pit on pressure, and cannot be pinched up into folds, or moved over the deeper structures, to which it seems firmly adherent.

The infiltration merges gradually into the surrounding tissue and its boundary is consequently ill-defined. In color it may be white or waxy, but is, as a rule, more or less pigmented. The temperature may be normal or even slightly increased, but usually is somewhat (1° to 2°) lower than that of the healthy skin. The rigidity of the integument seriously limits or suspends movement of the

diseased surface. The features are rigid, immobile, and expressionless, as though cut in stone. The lips are contracted, the mouth narrowed, and the eyelids can hardly be closed. Attacking the chest or abdomen, respiration is interfered with, and the mammæ flattened. The extremities become fixed in a more or less flexed position, and the joints pseudo-anchylosed, their immobility being due not to bony union, but to contraction of their integumentary covering.

The mucous membranes are by no means exempt.

Having, after the lapse of weeks, months, or years, reached its acme, the affection may remain quiescent for a variable length of time, or it may gradually undergo spontaneous involution. Frequently, however, the sclerotic skin becomes atrophic. The contraction and constriction produce atrophy of the subcutaneous fat, fascia, and muscles, and the integument becomes firmly adherent to the bone, so that, literally speaking, the part seems made up solely of skin and bone. According to Crocker and others, atrophic changes occur only in those cases in which the disorder begins as a hard edema, whereas in the fibrotic or infiltrated form of the disease the patches remain unchanged.

The general health is not affected in the earlier stages and may remain good for years, but eventually, in the bad cases, the patient becomes depressed, emaciated, and a state of marasmus supervenes, which sooner or later terminates in death.

Etiology.—The etiology of scleroderma is obscure. It is more than probable that the tegumentary changes are due to disorder of the nervous system, to use a somewhat vague expression. Among the immediate exciting or predisposing factors that have seemed to play a part in the production of scleroderma, may be mentioned exposure to extremes of temperature, rheumatism, erysipelas, mental emotion, etc., while on the other hand, cases have developed without any appreciable exciting influence. The disease is commoner in women than in men, and although met with at the ex-

tremes of life, is more prevalent in persons of early adult or middle life.

Prognosis.—On the whole the prognosis may be declared to be uncertain. Some cases recover spontaneously in months or years, while again the disease may persist indefinitely, or end in marasmus and death. The cases that begin with edema pursue a more unfavorable course than the infiltrated form.

Treatment.—The treatment is unsatisfactory. Particular attention should be paid to improving the general nutrition of the patient, and to diet and general hygienic measures. Phillipson reports two cases of generalized scleroderma in which a cure was effected by the administration of salol in doses of from 1 to 4 gm. daily. This is in keeping with Graham's suggestion of the value of antirheumatic remedies in the disease. Very naturally, thyroid extract, or thyroïdin, might be tried in suitable cases, but it would seem that Osler's personal experience is not in its favor, although he states that it may be tried without harm to the patient. H. Hebra has recommended deep injections of thiosinamin (10 minims of a 15 per cent. alcoholic solution) every second day, and arsenious acid has also been administered hypodermically.

Locally, electricity and stimulation by shampooing and massage have been recommended. With the latter we may use lanolin containing 1 per cent. of salicylic acid.

MORPHEA (CIRCUMSCRIBED SCLERODERMA).

Description.—This peculiar affection is sometimes called the keloid of Addison. In the more usual form of the disease the lesions are present in the skin as variously sized, round, oval or irregular patches having well-defined margins surrounded by a lilac border made up of minute capillaries. The appearance of the morphea patch is so characteristic that once seen it is not readily forgotten. The comparison of the general appearance of the lesion to

a plaque of old ivory set in the skin is very happy, although at times the color is pinkish, or perhaps of various shades of brown, yellow, purple, or black. The surface of a patch is generally smooth or slightly wrinkled, and in the beginning may be somewhat elevated above the surface, level with it, or later a little sunken. The disease is, as a rule, symmetrical. A certain amount of pain is present in some cases, but often this is absent. Slight or even marked itching may be a symptom.

Sometimes there is only one patch to be noted, but in other cases there may be a number present. After a variable duration—months or years—the disease may undergo involution, leaving the integument perfectly normal, while in other instances contraction and deformity with wasting and general atrophy, especially of the limbs, may result. Morphea may assume other features than those just mentioned. The disease may occur in bands, streaks, and atrophic pits.

Etiology.—Females are more often affected than males. All save one of our patients have been females, the youngest being fourteen years of age, and the oldest thirty-six. It is said that the band form is more frequent in children. The condition of the general health seems to have no definite relation to the causation of the disease. Various kinds and degrees of local irritation would seem to act as exciting causes in some cases. By most writers morphea regarded as a circumscribed form of scleroderma, a relationship that is borne out by certain clinical and anatomical circumstances.

Prognosis.—A guarded opinion as to the probable course and termination of morphea is demanded, although, in a general way, it may be stated that after some years there is a tendency to the disappearance of the disease, and mostly without local detriment.

Treatment.—Among the internal remedies that sometimes seem of value in this disease may be mentioned thyroid extract or thyroïdin, iodide of potassium, salol, and the salicylates.

Naturally, the x -ray has been used in morphea. Belot, who has had some experience in the matter, says that it is well known that certain cases of morphea get well spontaneously, and that we should, therefore, be cautious in attributing any amelioration to the use of the x -rays alone, and he agrees with Pfahler that the results of this treatment are but small in comparison with the time and energy expended. Brocq employs electrolysis, making use of a current of from $\frac{1}{2}$ to 10 ma. according to the amount of infiltration and the endurance of the patient. The operation is practically the same as that for the destruction of the hair papilla (*q. v.*).

Mercurial plaster is used in conjunction with this treatment. Thiosinamin injections have been used as in keloid.

Although Brocq reports favorably on the use of electrolysis in morphea, we believe that as a method of treatment it will find no wide acceptance, being both tedious and painful.

Leredde says that the high-frequency current is to be recommended in certain cases. Galvanism and massage may be tried, as well as general and local static electricity.

ELEPHANTIASIS.

Description.—Elephantiasis, sometimes called elephantiasis arabum, lepra arabum and Barbadoes leg, has nothing in common with leprosy. The disease is characterized by repeated attacks of inflammation, by hypertrophy of the skin and subcutaneous tissue, and, as a result, by enormous enlargement and deformity of the parts affected. The disorder is both endemic and sporadic, and, while differing symptomatically in some respects according to the exciting cause, the result is in all cases the same.

According to Crocker, nothing corresponding to the elephantoid fever is observed in England, but the febrile attacks agree in extent and severity with the attacks of erysipelas. In a number of cases that we have seen the

same state of affairs was noted, or else the enlargement was progressive, but was unaccompanied by any fever at all.

The regions most commonly affected are the legs, usually one only, but in tropical countries often both, the male and female external genital organs, the arms, fore-arms, hands, scalp, ears, lips, cheeks, and tongue. As commonly seen on the leg, the clinical picture is striking. The most notable feature is, of course, the enormous size of the member, hence the name of "elephant leg." The limb is misshapen and unwieldy, and the normal contours are effaced. The condition of the skin varies in different cases; sometimes it is dry and tuberculated, sometimes smooth and parchment-like, and in other cases eczematous, ichthyotic, warty, or deeply fissured. The lymphatics often become varicose, and a veritable lymphorrhea is not infrequent.

Subjective sensations are not especially marked. When eczema exists as a complication, there is considerable itching, and during the inflammatory exacerbations the local suffering may be severe. Pain may also be present if the case is complicated with deep fissures and varicose ulcers. The great weight of the affected parts, and the inconvenience arising therefrom, cause the most annoyance.

A condition called lymph scrotum, varix lymphaticus, or nevoid elephantiasis has been described as occurring in China, in which, according to Manson, there are present on the surface of the scrotum vesicles and enlarged lymphatics that when pricked or spontaneously ruptured discharge a coagulable fluid. A very remarkable state called "acromegalia," which, however, is only objectively allied to elephantiasis, has received attention from various writers. The disease is an hypertrophy of the head and extremities, occurring in middle life, and presenting symptoms that are mainly connected with the nervous system. According to Shepherd an enlargement of the pituitary body has been found postmortem, and the thyroid gland is atrophied or diseased.

Elephantiasis is due to the occlusion of lymphatics, the

result of inflammation, or arising from mechanical causes. Tropical elephantiasis is now known to be caused by the presence of the *Filaria sanguinis hominis*, the mosquito being the intermediary host.

As seen in this country, the disease may be brought about in a variety of different ways, such as, for example, by repeated attacks of erysipelas, chronic eczema of the lower extremities, etc.

Cases have been reported in which there was an apparently hereditary influence. One of the most remarkable cases that ever came under our observation was in the person of a lady who had been confined to her chair for many years by rheumatism. In this instance both legs were enormously enlarged.

Prognosis.—It is said that in the early stages of the disease spontaneous recovery may take place, but, as ordinarily seen, elephantiasis is a persistent affection, although not necessarily a fatal disorder.

Treatment.—In tropical cases, change of climate is the most reasonable prescription. Drugs are not especially efficient, except in the acute stage to relieve the inflammatory symptoms and the attendant pain. Rest and an elevated position of the parts are to be recommended. Elephantiasis of the genitals may be advantageously treated by amputation. Ligature of the main artery of the limb is generally only palliative, but a sufficiently large number of satisfactory results have been reported to warrant the operation in severe cases. Morton secured a good degree of amelioration by excision of a portion of the sciatic nerve in a case where ligature of the iliac artery had been futile. The application of blisters and the inunction of iodine and mercurial salves have been advocated. Moncorvo and Silva Arango have used a galvanic current of 40 to 60 Trouvé elements with remarkable success. The applications lasted from five to thirty minutes, the positive electrode being placed on the healthy parts and the negative moved about over the affected region. In 1879 one of us¹

¹ Hardaway, St. Louis Courier of Medicine, May, 1879.

suggested the use of the Martin bandage, although it had probably already been used by others. The leg should first be powdered with starch, to which may be added a small quantity of salicylic acid, and over this a thin stocking should be drawn, as the rubber coming directly into contact with the skin is too irritating. When the patient is confined to the house, the limb may be kept elevated. We have seen good results from the application of Squire's glycerole of the subacetate of lead, used in the same strength and put on in the same way as for eczema rubrum of the leg. The compound salicylated-soap plaster spread on strips, and evenly bound on the leg, has proved useful in our practice. Ulcers may be dressed with xeroform. These latter procedures have reference, of course, to the treatment of the eczema, etc., that often accompany the elephantiasis, but in a case in which one of us used the glycerole of lead dressing, an exceedingly profuse, watery discharge came from the legs, and there ensued a remarkable diminution in their size.

MYXEDEMA.

Description.—This is a general disorder of nutrition, due to atrophy or loss of function of the thyroid gland. There are two forms: the congenital, also known as sporadic cretinism, and the acquired.

The latter is more common in women than in men, and is more apt to appear after middle life. Several members of a family may be affected, and maternal transmission of the disease has been observed. The facial expression is characteristic: the features are broad, coarse, and apparently puffy; the lower lip is thick and everted, and the lines of the face obliterated. Moles and warty growths are common. The general integument, as well as the mucous membranes, are almost equally affected; the hands and feet, for example, being swollen and clumsy. There is a fairly general alopecia, and the nails are stunted and

brittle. Tumefaction of the skin and subcutaneous tissue is marked in the supraclavicular regions. Speech is slow and the mental faculties are greatly dulled. The average bodily temperature is subnormal. Certain cases of chronic edema of the face following recurrent erysipelas should be carefully differentiated by the history, and the exclusive localization of the process in the one locality.

Treatment.—The treatment is by thyroid feeding, as originally suggested by Murray, or the more recently introduced thyroidin. Small doses should be used in the beginning. Protonuclein has also been advised.

ATROPHIES.

LEUCODERMA.

Description.—Leucoderma, vitiligo or “piebald skin,” which must be distinguished from albinism, is an acquired pigment atrophy of the skin, characterized by variously sized and shaped, smooth, white, non-elevated patches, surrounded by hyperpigmented borders.

As stated above, leucodermic spots have different shapes, being more or less round, ovalish or irregular in outline. They vary from finger-nail to palm-size and even larger, especially when several patches have run together. The color is generally a milky-white, although sometimes with a pinkish tint. Hairs occurring in their areas may be white, or else retain their natural color. The skin, with the exception of its pigmentless condition, is normal, both objectively and subjectively. Around the patches the skin is very much darker, owing to an excess of coloring matter in these situations. Leucoderma is generally symmetrical, and is most usually found upon the sides of the neck, face, about the hips,¹ the backs of the hands, and the extremities. The disease is always worse in summer, or, rather, it is more conspicuous at that season, owing to a more decided contrast between the pigmented and non-pigmented portions of the skin. The disorder, that is the symmetrical form, tends to steady progression, finally involving the whole body, and sometimes in this way abolishing the lines of demarcation between the light and dark parts of the skin. In two cases under our care, one of which occurred in a negro, the leucoderma became absolutely universal. Often the progress is stayed for a longer or shorter time, and sometimes, although rarely, the pigment may be renewed.

Both sexes are said to be affected equally.

¹ The spots are rarely absent from this situation.

The disease generally makes its appearance some time between the tenth and thirtieth years, but we have seen it as early as the fourth year in one case, and in others in the eighth. The etiology of leucoderma is obscure, and we must content ourselves at present with regarding it as due to some disturbance of innervation. Cheatle has called attention to the frequent coincidence of the starting points of the disease with Head's maximum points.

Prognosis.—It will be seen from the foregoing account that the prognosis is unfavorable, although it is proper to state that in rare instances the pigment has been known to return.

Treatment.—Little or nothing can be accomplished by drugs, either internally or locally. We have never seen any good come from the use of arsenic, iron, etc. McGowan has given adrenalin. With several willing patients we have tried all manner of stimulating local applications, viz., electricity, the sun glass, blisters, chrysarobin applications, etc., but all without permanent effect. It is quite possible, however, to ameliorate the disfigurement by getting rid, temporarily, of the hyperpigmented borders, or by staining the white parts with some brown pigment. Dr. Savill paints the brown patches with pure phenol. This depigmentation may be secured also by the use of the white precipitate and bismuth salve advised in freckles. Cutler recommends the following combination:

R—Resorcini	3j
Hydrarg. chlor. corros.	gr. ij
Acidi acetici diluti	5ij
Aquæ q. s. ad	3ij—M.

S.—Apply over the pigmented area two or three times a day with a camel's hair brush.

Ullmann obtained good results with the x -rays.

Montgomery, of San Francisco, greatly benefited one case by phototherapy.

Faradism, and galvanism with the negative electrode to the affected area have been recommended.

ATROPHIA CUTIS.

Description.—Aside from the various atrophies of the appendages of the skin and of the pigment, and the atrophies connected with a number of cutaneous diseases, the treatment of which has been given in other places, there are certain atrophic states of the skin proper, which will be merely mentioned here since for the most part they are incurable.

1. Senile atrophy of the skin.
2. Diffuse idiopathic atrophy of the skin.
3. Congenital atrophy of the skin.
4. *Striæ et maculæ atrophicæ*.
5. *Kraurosis vulvæ*.

Treatment.—The management of the seborrheic patches and warty growths found in relation with senile atrophy has already been considered. (See *Keratosis Senilis*.) As regards the essential changes in the skin of old people there is, as a matter of course, no treatment beyond attention to ordinary rules of hygiene. *Kraurosis vulvæ*, which manifests itself as an atrophy of the genital organs in women,¹ is generally regarded as incurable. Heitzmann, however, recommended curetting the thickened patches, and the subsequent application of lotions of salicylic acid and pyrogallol. Martin and others advise excision of the affected parts. In a case quoted by Belot, in which radiotherapy was tried, the result was favorable.

PERFORATING ULCER.

Description.—The disease which goes by the name of “perforating ulcer” is almost invariably connected with some affection of the nervous system, and, therefore, belongs to the class of affections due to trophic disturbances.

¹ See Ohmann-Dumesnil, *Monatsh. f. prakt. Derm.*, 1890, vol. x.

In most instances, the original malady has been locomotor ataxia or a peripheral neuritis, such as arises in alcoholism, syphilis, or leprosy. The ulcer usually occurs on the plantar surface over the metatarsophalangeal joint of the big or little toe. As a rule, only one ulcer exists, but cases have been seen in which several were present. Not infrequently the ulcer begins as a suppuration under a corn which burrows into the soft tissues. Finally, the corn is detached and the orifice of a sinus is exposed, which often leads down to dead bone. From continual pressure in walking the edges of the sinus become much thickened. There is generally no pain connected with perforating ulcer, not even on pressure. There are usually present, in part, other evidences of neurotic disturbance, such as anesthesia, loss or deformity of the nails, tylosis, etc.

The course of the disease is slow, but progressive.

Treatment.—In the management of perforating ulcer the essential thing is prolonged rest. Proper orthopedic appliances might be indicated in some cases. Treves recommends paring down the thick edges and filling the sinus with a cream composed of salicylic acid and glycerin, to which 2 per cent. of carbolic acid has been added. Curetting and excision are advised. After healing, a thick felt pad, cut out over the scar, is to be worn, and every precaution taken to prevent fresh injury. Amputation is sometimes necessary. Stretching the sciatic nerve has been strongly advocated.

AINHUM.

Description.—This is a very unusual and peculiar affection, which for a while was thought to be confined to the negro, but recently cases have been observed in India. So far as recorded, no white person has ever been affected by it. In the majority of cases the initial symptom is a furrow on the line of the digitoplantar fold of the little toe; this furrow gradually becomes deeper, and the toe assumes an

ovoid shape, having increased to two or three times its normal size. The furrow, as it increases in depth, finally forms a circle around the toe until the member is attached by a mere pedicle. As a rule, there is neither pain, inflammation nor ulceration, but when ulceration does occur the pain may be severe. The etiology is obscure.

Treatment.—It is stated that if in the beginning the constricting ring is cut across at right angles the advance of the disease may be stayed. When, however, the constricting band has completely encircled the member, amputation is demanded.

NEW GROWTHS.

KELOID.

Description.—Keloid is a fibrous new growth of the corium which usually follows injuries. The lesions of keloid consist of variously sized elevations which rise abruptly from the healthy skin. The integument over such growths is smooth, shining, and somewhat stretched; it may be of the hue of the surrounding skin, or of a pink color.

The tumors have various shapes, but usually present claw-like prolongations around the periphery. To the finger, keloid is firm, but not hard. The most common site of the disease is over the sternum, but it may occur upon any part of the body. One keloid alone is usually present, but if the disease has developed from the scars of a generalized eruption, such as smallpox, there may be large numbers upon the body. In some cases the tendency is to slow but steady progression, but in others, after reaching a certain size, the growth remains stationary. Keloid sometimes undergoes involution. Most keloids are tender on pressure, and in some there is spontaneous pain of a burning or pricking character.

A condition resembling keloid in many of its aspects is the hypertrophied scar. This condition is most apt to occur where a wound of the skin has not healed by first intention. There is an overproduction of scar tissue, resulting in a raised, reddish or white, generally smooth and shining cicatrix. If the wound was sutured, there are very apt to be prolongations of the scar about the suture points, which make the hypertrophied scar much resemble keloid.

The negro race is especially prone to keloid, and among them hypertrophied scar is very common. It is very likely that keloid is always the result of an injury, the trauma

being so slight as to pass unnoticed in those cases where the disease seems spontaneous.

Prognosis.—This is, as a rule, unfavorable, although cures have been effected in some cases, and in others the growths have spontaneously diminished in bulk, or disappeared.

Treatment.—The treatment of keloid by **internal** remedies is generally negative, although arsenic and thyroid extract (Stelwagon) have been employed. The removal of keloid by the knife or caustics is unsatisfactory, as the growth nearly always recurs, often in an aggravated form. The *x*-rays should be tried first in all cases of keloid, especially in large growths. It has the advantage of painlessness, and is no more tedious than other forms of treatment. Our own results have been variable, but encouraging upon the whole, and as Belot remarks, while the treatment is not infallible, it usually gives satisfactory results. Belot advises that a violent reaction should be avoided, and states that he seldom exceeds a dose of 6 H. or 7 H. repeated every fifteen or twenty days. We have employed the *x*-rays in keloid with partial success in about the same manner as that used in epithelioma (*q. v.*). Pusey, in many cases of keloid and hypertrophied scar, never failed to get great improvement or complete flattening by this method. As suggested by one of us¹ many years ago, and confirmed by others, notably Brocq and Crocker, electrolysis, while tedious and painful, gives at times quite good results. Today we reserve its use for small growths. The procedure is the same as for the removal of hair, etc. We attach, however, to the negative pole a tolerably stout sewing needle, No. 10 or 11. This is plunged through the keloid in various directions, making parallel as well as perpendicular thrusts, and also passing the needle some distance beyond the apparent boundaries of the growth. A current of 5 or more ma. should be employed. Sinclair Tousey has employed, with sat-

¹ Hardaway.

isfactory results, from 10 to 15 minims of a 10 per cent. solution of thiosinamin hypodermically. G. T. Jackson, however, reports unfavorably on this method. Marie and others have advocated the injection into the tumor of a 20 per cent. solution of creosote in olive oil. Verneuil employed pressure with the elastic bandage. Various palliative measures have been recommended, such as the application of mercurial plaster, lead ointments, etc. Brocq believes that pain may be relieved by linear scarification. Stelwagon advises, as a means of relieving the pain and itching, and probably retarding the growth of keloid, an application of the following sort:

R ^y —Acidi salicylici	gr. x-xx
Empl. plumbi,	
Empl. saponis	aa 3iij
Petrolati	q. s. ad 3j—M.

To this ointment may be added from 1 to 2 drachms of ichthyol.

For the relief of the subjective symptoms present in keloid, we may employ menthol in solution or salve, belladonna, or even morphine, hypodermically. The effect of the *x*-rays is marked.

CICATRIX.

Description.—A scar is a new formation of dense connective tissue replacing a destruction extending below the uppermost parts of the corium. While well worthy of study for their diagnostic import, we are in this work only concerned with such scars as call for therapeutic interference. These include: (1) hypertrophied scars; (2) those producing distortion of natural orifices; (3) those which immobilize joints; (4) disfiguring scars upon the face; (5) certain scars presenting abnormal vascularity; (6) painful or itching scars.

Hypertrophied scars are considered in this work in the article on keloid. Those in the second and third classes

may be benefited by the methods there advised, but generally demand surgical procedures, such as excision with loosening up of the edges, grafting, or a plastic operation. Varney claims to have benefited pits left upon the face after small-pox or acne by pushing the use of the *x*-rays to the point of obtaining a moderate reaction. Something might be accomplished by means of paraffin injections.

Excessive vascularity will usually yield to time. Large vessels which remain may be destroyed by electrolysis.

Pain and itching will often be relieved by the *x*-rays, but may call for excision followed by grafting.

DERMATITIS PAPILLARIS CAPILLITII.

Description.—This is a chronic disease of hairy regions, consisting of firm, vascular papules, which by their growth and coalescence form rounded or lobulated tumors of pea to bean size, gradually flattening down into keloid-like masses.

This disease is more often seen in negroes, and in adult males of this race. It affects chiefly the posterior margin of the scalp, extending into the hair and down the back of the neck, with a preference for the middle line. There are generally one or more larger growths midway of the hairy margin, with smaller lesions toward the periphery of the group.

Prognosis.—The disease shows a marked tendency to recurrence.

Treatment.—The growth may be dealt with by excision, the electrocautery or electrolysis. Scarification may be employed, as advised under Keloid. Pusey found the *x*-rays of value.

FIBROMA.

Description.—Small fibromatous growths are not uncommon in the skin; they are usually few in number, of small size, and give rise to no especial inconvenience.

In that form of fibroma molluscum known as **multiple fibroma** the tumors vary in size from a split pea up to the dimensions of an egg or larger. They also differ much in shape, consistence, and other physical characters. Some are rounded and embedded in the tissues, or else they may be pendulous and pedunculated, and assume various shapes; they may feel soft and gelatinous, or hard or fibrous; the overlying skin may be normal in color, pinkish or pigmented, and it may be loose or stretched; and finally the lesions may be occupied by a few hairs, and one or several comedones may be visible.

Among the other growths, here and there, are to be observed some that are flaccid and empty, "like a little purse, out of which the money has vanished." The tumors may be numbered by the hundred or thousands, and exhibit all grades of development. In some cases the tumors undergo involution, but, as a rule, they continue to increase in size and number.

The patient makes no complaint of subjective symptoms, and relief is sought only for the removal of the unsightliness and inconvenience of the disorder.

Fibroma pendulum usually occurs as a solitary, pendulous, pear-shaped tumor, most frequently situated on the face or neck, or near the groin or axilla. Sometimes these growths are of an enormous size, and cause great annoyance to the unfortunate person bearing them.

Von Recklinghausen states that the multiple fibromata of the skin are in reality neurofibromata.

Treatment.—Whitehouse gave arsenic in the form of Asiatic pills in a case of multiple fibromata, with the result that a large number of tumors disappeared, but such an experience is exceptional, and the treatment, if practicable at all, is **surgical**.

The treatment of the large, pendulous masses and flaps of skin is surgical. The smaller tumors may be snipped off with scissors or removed by electrolysis, ecrasement, ligation, or the galvanocautery.

MYOMA.

Description.—Myoma of the skin occurs as small, multiple growths, or as a single larger tumor. The first variety is very rare, only 12 cases having been reported. The affection occurs as patches of lenticular-shaped tumors, the skin over which may be normal in color or more commonly of a reddish hue. Nearly all the cases have been accompanied by pain, either spontaneous or provoked by pressure. Some of the lesions may undergo involution, but the tendency is to slow progression.

The large, single myomata are not so rare. They occur as variously sized tumors, sessile or pedunculated, chiefly on the breasts and genitals. Such tumors are very slow growing, and do not, as a rule, cause pain.

The only method of **treatment** for myomata is ablation, which is often demanded by the pain of the tumors.¹

NEUROMA.

Description.—Under this name there have been described, from time to time, tumors of the skin or subcutaneous tissue that were accompanied by more or less pain, often of a neuralgic character. On microscopic examination such growths have usually been found to be made up of fibrous tissue with some nerve fibers.

Duhring's and Kosinki's cases, which are usually quoted as examples of pure cutaneous neuromata, were **treated** by removing part of the **nerve** trunk distributed to the tumors.

¹ In a case of ours first published in the American Journal of the Medical Sciences, April, 1886 (Hardaway), with a subsequent report made eighteen years afterward, the original excised patch returned and the patient developed many other tumors. The x-ray was tried a few times, apparently giving relief to the pain, but the patient refused further treatment.

LIPOMA.

Description.—The larger lipomata come under the care of the surgeon. Smaller, multiple growths, however, may properly be considered a dermatological condition. This form usually possesses a dense, fibrous stroma so as to constitute more properly a fibrolipoma. Their possessors are usually of good general health and of muscular development above the average. The growths, from pea to small egg size, are usually scattered, from one-half dozen to fifty or more in number, about the extremities. They are seated in the lower connective-tissue structure of the skin. They can be recognized by their chronicity, painlessness, multiplicity, distribution, firmness, and generally by a characteristic lobulated feel.

Treatment.—Ordinarily treatment is not required. When troublesome, by reason of their situation or unsightliness, they may be excised.

XANTHOMA.

Description.—Xanthoma, also sometimes called xanthelasma and vitiligoidea, is characterized by flat or elevated, buff-colored lesions. It is a comparatively rare disease. Xanthoma is met with in two principal varieties, the plane or flat form (xanthoma planum) and the elevated or tubercular and tuberoso form (xanthoma tuberculatum or tuberosum). In some instances all of the varieties of the disease may be present at the same time (xanthoma multiplex).

Xanthoma Planum.—In this form of the disorder the plaques, of a yellow or buff color, are only slightly if at all elevated above the level of the skin, and when pinched up between the fingers the patch feels smooth and without apparent infiltration. The comparison of these lesions to chamois leather embedded in the skin is quite happy. Xanthoma planum occurs mostly on the skin of the eye-

lids, and perhaps more frequently on the upper than the lower lids. The left side at the upper, inner angle is apt to be attacked first, but symmetry is sooner or later established. The patches on the lids are usually present in the form of narrow bands, often running quite across from one canthus to the other. Occasionally a series of patches may surround the eyes completely. The plane variety may develop elsewhere.

Xanthoma Tuberculatum.—The tubercular form is represented by variously sized growths, ranging from the diameter of a pin's head to that of a walnut, or even larger.

They are usually of the same color and consistence as in the plane variety, but are sometimes of a reddish yellow. When a number of small growths have coalesced, the resulting tumor is lobulated, and perhaps more resistant to the touch. The tubercles and tumors are prone to develop at sites of pressure and on exposed parts.

Pain is sometimes complained of in this form, whereas in xanthoma planum there are no subjective symptoms whatever.

Xanthoma Diabeticorum.—Under the name of xanthoma diabeticorum some 30 or more cases of a peculiar form of xanthoma have been reported. Especial attention was called to it by Malcolm Morris in 1883.¹ The eruption consists, according to Crocker, of dull-red, firm, discrete or confluent papules from a line to one-sixth of an inch in diameter, well defined at the margin and of an obtusely conical or roundish shape. On the top of most of them is a yellow or yellowish-white head, and some of the lesions are dotted and streaked with red from the presence of capillary vessels. The papules, owing to this coloration, simulate pustules, but in reality they are solid. The usual sites of the eruption are the elbows, knees, and buttocks, but it may occur anywhere on the skin, on the mucous membrane of the mouth, and in some instances on the eyelids.

¹ Pathological Society Transactions, xxxiv. See Johnston for a full bibliography, Journal Cutaneous and Genito-urinary Diseases, October, 1895.

The lesions come out rapidly at first, and after persisting for a variable period—months or even years—may disappear as rapidly, leaving no mark behind them; or, again, new lesions may appear while others are undergoing involution, or they may all disappear for a season to reappear at some future time. Itching, burning, and tenderness may be present. With a few exceptions the cases have all been men and the majority of patients have been between thirty and forty years of age. There has been a history of sugar in the urine in most instances, but not in all. Pentose was found in the urine in one case. Sabouraud says of this condition that it may be true xanthoma or a “diabétique xanthalasmiforme.”

Prognosis.—The course of the disease is chronic, and usually the lesions, when fully established, are permanent. This is especially true of xanthoma palpebrarum. The multiple form may undergo spontaneous involution.

In diabetic xanthoma the prognosis is favorable.

Treatment.—The treatment of xanthoma of the lids is entirely local. Sabouraud speaks so positively of the curative effects of the galvanocautery that we shall mention it first. He makes a series of punctures with a galvanocautery 2 to 3 mm. apart and at intervals of a fortnight. He asserts that the lesions disappear at the conclusion of three such treatments. G. H. Fox first recommended electrolysis for the removal of xanthoma palpebrarum, and we have made use of this method for many years. A fine, stiff sewing needle should be employed, attached to the negative electrode, using a current of 1 to 5 ma., although we must repeat that experience in the use of electrolysis is a better guide than any instrument of precision. The needle should be passed from side to side and deeply, there being but little fear of any marked scarring. Superficial puncture removes the growth only temporarily, and the same may be said of applications of trichloracetic acid. Pusey suggests deep freezing under pressure for ten or fifteen seconds, with liquid air or solid carbon dioxide.

The use of corrosive sublimate, 10 per cent., in collodion

(Stern) is not to be advised. Excision is, we believe, the favorite method of treatment with ophthalmologists. In a case of xanthoma multiplex Morrow applied a 25 per cent. salicylic acid plaster to nodules on the soles and knees, which after being worn for several days was removed, the softened tissues coming away with it, and a simple diachylon plaster put on. Leslie Roberts used the following paint on some palmar lesions:

R—Acidi salicylici	3j
Chrysarobini	5ss
Olei ricini	5ss
Collodii flex. q. s. ad	3j—M.

The x-rays and the high-frequency current have also been employed. The former failed with one of us after a thorough trial. Evans and Whitehouse had better success. In **diabetic xanthoma** the glycosuria should receive the usual dietetic and medicinal treatment, and the accompanying pruritus should be palliated by menthol or other similar remedies.

ANGIOMA.

Description.—In a general way an angioma may be defined as a condition of the skin in which there is new growth or permanent dilatation of bloodvessels. It is difficult to give a clear definition of the angiوماتa from an anatomical standpoint, but for clinical purposes the following classification will be found sufficient:

Angioma Simplex.—According to Unna, this is the most frequent type of cutaneous angioma. It is usually congenital, first appearing as a small point, but afterward it grows more or less rapidly and may assume enormous proportions, whereas the angiomatous nevi grow merely with the growth of the body. Simple angiomas are usually found on the head or neck, or about the trunk and extremities; even the mucous membranes are not exempt.

They vary from hemp-seed to cherry-stone or walnut

size, or they may occupy quite extensive areas. They are bluish-black or bluish-red in color, at first usually level with the skin and smooth to the touch; but later they become compressible, and somewhat irregular and lumpy in appearance. At times they undergo involution, or cystic or cavernous changes may occur. Sometimes marked pulsation may be observed. Variations in size and color may also be noted at times.

Various complications may occur; the skin covering the tumor may ulcerate and alarming hemorrhage ensue, or gangrene may develop.

Angioma Cavernosum.—The true primary cavernous angiomata (Winiwarter) are diffuse or defined soft tumors, lobular or hemispherical, and of a bluish or, less rarely, red color. They diminish under compression, or again become turgid when pressure is exerted about them. When encapsulated they are movable under the skin. They are frequently painful. They are usually seated under the skin, and rarely multiply. They most often appear during the first year of life, and sometimes in response to some traumatism. They grow slowly, but at times they invade the soft tissues extensively and attack bone and cartilage.

Nævus Vascularis.—The term vascular nevus, used in the sense of port-wine mark, feurmal, tache de feu, nævus flammeus, etc., represents an exceedingly common disorder. It is usually congenital. It may appear as a flat or elevated patch of a bright-red or claret color and occupy only a small extent of surface, or be spread over large areas. The integument may be quite smooth, thin, or else present numerous rugosities and considerable hypertrophy. Little polypoid growths, darker in color than the nevus itself, are sometimes scattered over the affected region. The color of the nevus may be made to change by pressure or under the influence of position. A common site of these growths is the face, and they are usually unilateral.

Telangiectases.—These develop as primary or secondary phenomena, although at times it is difficult to determine

their cause. The usual sites are the face, neck, and upper part of the trunk. A common clinical form is the *nævus araneus*, or spider cancer, in which there is a central red spot with radiating lines. In other cases small, red or bluish vessels are seen coursing over the skin. These are frequently seen upon the cheeks and nose in elderly persons. In some rare instances almost the whole body may be covered by telangiectases. Telangiectases are also seen on mucous membranes or about the nares, the ocular conjunctiva, and the pharynx. Telangiectases may result from any cause that produces long-continued congestion of the skin, such as interstitial changes in the kidney or liver, emphysema or other lung affections. Local obstruction to the cutaneous circulation also causes them; hence they are found at the periphery of scars and over new growth. Telangiectases constitute the essential features of rosacea in the second stage.

Treatment.—Very superficial, reddish stains occasionally seen on the faces of children at birth, and sometimes the small, simple angiomas, undergo retrogression. Both Crocker and Stelwagon recommend painting on several layers of collodion for some days or weeks, or the use of continuous pressure when the lesion is over a bony prominence. This treatment is of no avail unless instituted within the first few days of life. Brushing over the growth with liquor plumbi subacetatis (Bligh) has also appeared useful.

Electrolysis is, however, by far the best method of treatment in small capillary nevi.

As the patients are usually infants, general anesthesia is essential. The positive electrode, suitably covered, is applied to some indifferent part of the body by an assistant, and a medium-sized sewing needle, which has been attached to the negative electrode, is thrust directly or somewhat obliquely into the growth; or sometimes moved from place to place. After the current has been allowed to act for a few minutes the positive electrode is released and the needle withdrawn. The strength of the current to be

employed, the number of punctures required, the length of the sitting, etc., are matters to be determined by the nature of the lesion. In small growths, mild currents—1 to 5 ma.—and one sitting, are all that are necessary for obliteration.

For large nevi bipolar electrolysis may be employed. The needles may be placed parallel and equidistant from each other and from the sides of the tumor, or the positive needle may be placed in the centre of the growth, and the negative needle may be moved from place to place or reintroduced at other points. In large nevi not too much should be done at each operation, and it is best to have an interval of some weeks between sittings, so that results can be more accurately gauged and unnecessary destruction avoided. Duncan, of Edinburgh, one of the earliest advocates of electrolysis in nevus, used steel needles insulated with vulcanite, the exposed points varying from one-eighth to one-quarter of an inch. The positive needle may be of gold or iridoplatinum, since those of steel undergo oxidation. For adults general anesthesia is usually unnecessary if the electrolysis is done a little at a time and the current is properly interrupted. (See Hypertrichosis.)

Innumerable other methods of treating angiomata have been recommended from time to time, and many of these procedures have their advantages for certain cases. Thus, according to the size, location, and other features of the growth we may make trial of excision, the ligature, the application of caustics, etc. The injection of irritants into the growth and vaccination over the lesion are not to be recommended. We have seen some excellent results in extensive nevus from Wyeth's hot-water method, but it requires great care in the administration and may give rise to some very ugly after-effects. Gottheil thinks well of the galvanocautery, and has devised an excellent instrument that may be used for this or similar purposes. The high-frequency current applied by means of the carbon-pointed electrode has also been employed by Bulkley.

Various methods have been recommended for the removal of **port-wine mark**, such as linear scarification, tattooing with needles dipped in carbolic acid, etc. Some years ago one of us¹ advised the employment of electrolysis in this affection also, and this procedure still holds the first place in our estimation. In many cases, where small and very superficial nevi are concerned, the blemish may be entirely abolished, and in other instances, of more extensive involvement, we are quite safe in promising considerable amelioration. The operation presently to be described has especial reference to flat nevi of considerable extent.

The **modus operandi** consists in the use of a needle or needles, placed in a suitable holder, which latter is attached to the negative pole of a galvanic battery. The successive steps of the operation are the same as those described in connection with the removal of superfluous hairs. (See Hypertrichosis.) The most important point relating to any destructive operation upon the skin is that the operator should control the destroying agent as much as possible. The facility with which this end is accomplished in electrolytic methods constitutes one of its chief merits. In order, therefore, to control this destruction in the most satisfactory way, we have for a long time discarded the bundle of needles and make the electrolytic puncture with one only.

By the cautious and expert use of this one needle we no longer set up extensive areas of suppuration, as was apt to be the case with the crown of needles; and since employing the single needle we have no fear of the keloidal scars, which sometimes followed the introduction of the bundle. The operation is thereby rendered somewhat more tedious, but certainly safer. It is a tedious thing to do at best, for when the puncture is made the surrounding region becomes so blanched that we are at something of a loss to know exactly where to make the next one to the best advantage, and the next day, for quite a space around

¹ Hardaway.

the place operated upon, there is an inflammatory areola, and perhaps crusting, which forces us to wait for a number of days before operating again. One cannot really form an estimate of the result in a given area until at least six weeks or two months afterward; and when all the space that one intends working upon has been gone over, the patient should be dismissed for a season. No one pretends for a moment that in a port-wine mark of any magnitude this operation will leave a normal skin behind it. In the majority of cases we aim to produce minute, multiple scars, which in time become white, and thus obliterate the nevus.

It often happens, however, that a large area is permanently blanched without scar by apparent obliteration of vessels at its periphery. In some cases intense, brown pigmentation takes the place of the red surface, which, however, gradually undergoes absorption, leaving the skin white. This generally occurs on parts where the skin is thin. Where one needle is employed the resulting scars are usually thin, supple, non-depressed, in no case leaving behind elevated knots and cords such as sometimes result from the galvanocautery.

Very often it is better, in a cosmetic way, to endeavor merely to lighten the color of the mark, rather than to convert it into a dead-white patch; of course, where the mark is quite small, a thin, white, and even glistening, cicatrix is not especially objectionable. It is not uncommon to find that in an apparently obliterated wine stain dot-like telangiectases will after awhile appear here and there. They must be again destroyed. After a good many years' experience we may add that while this operation is by no means ideal, it is perhaps better, in suitable cases, than anything else at our command.

The following procedure is advised by Dr. L. I. McArthur. A thin layer of skin is dissected off the nevus, going just deep enough to include the capillaries of the corium, which are thus obliterated in the resulting scar. Thiersch grafts are immediately applied. Pusey suggests

freezing flat lesions with liquid air or carbon dioxide. "A small area, from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch in diameter, is frozen by the application of liquid air or solid carbon dioxide for five or ten seconds. The depth of the freezing depends upon the amount of pressure exerted, and requires some care to gauge it correctly. After the freezing there is violent reaction, which persists for about ten days, and is followed by very slight scarring and destruction of a great part of the bloodvessels."

Phototherapy was recommended by Finsen. Out of 10 cases of the plane form, he obtained cure of 1 and improvement of the others. The results so far have not been especially brilliant, although Heidingsfeld and Allen have reported good results. The same may be said of the x-rays. Belot's conclusion seems to be a sound one, namely, where electrolysis gives good results it should be preferred to radiotherapy, since the application of the former is simpler, safer, and less expensive, although Pfahler believes that the latter gives results at least equal to any other. Jutassy, Schamberg, and Pusey have had excellent results by producing an acute dermatitis. The utilization of the Finsen light is practically impossible for the general physician. Holzknecht used radium successfully in a flat port-wine mark.

The treatment of **telangiectases** is fully described under **acne rosacea** and need not be given here.

Nothing acts so well in the **nævus araneus**, or spider nevus, as electrolysis. The negative needle is introduced in the central spot, and a weak current is allowed to pass for a few seconds. Sometimes it is also necessary to puncture the vessels diverging from the central point. Occasionally the operation has to be repeated, but it is better to make several operations than run the risk of a scar. Once in a while a considerable ecchymosis occurs after the operation, which will alarm the inexperienced, but it is of no consequence and presently disappears.

ANGIOMA SERPIGINOSUM.

Description.—Under the title of infective angioma or nevus lupus, Hutchinson first described an affection characterized by the appearance in the skin of minute bright-red papules having the appearance of cayenne pepper. The lesions are arranged in groups. Gradually increasing in size, and spreading by peripheral extension, and meantime, undergoing central involution, they eventually form rings and circles. New points, the “satellites” of Hutchinson, are constantly appearing just a little beyond the older patches, which in turn pursue a like evolution, so that in time large areas of skin are occupied by gyrate and serpiginous figures. According to Bowen the central involuted region was not observed to be atrophic in the reported cases.

There are no subjective symptoms. The progress of the disorder is slow, interrupted, however, at times by more rapid advances of the process of extension. The disease has been noted on the upper and lower extremities and in the scapular region with extension forward to the nipple.

The cause of the disease is unknown; Darier regards it as an anomalous type of sarcoma.

Treatment.—Cauterization or excision has been recommended. Crocker advises the use of electrolysis along the extending border so as to cause occlusion of the vessels. The use of the x-rays would naturally suggest itself.

LYMPHANGIOMA CIRCUMSCRIPTUM.

Description.—This is the only form of lymphangioma having especial interest in a dermatological way.

The disease first manifests itself, in the majority of cases, in childhood. It may affect almost any region of the body, cases having been reported in which even the mucous membrane was involved. The lesions which form the essential elements of the disease are deeply seated vesicles

with thick walls. These vesicles are not disposed singly, but are aggregated into patches of irregular shape from one-half to three inches in diameter. Owing to the thickening of the epidermis over the lesions, the patches have a warty look. The vesicles are of the size of very small peas, colorless or pinkish, and, when pricked, emit a clear, serous fluid containing lymph corpuscles. Over some of the vesicles telangiectasic vessels will be seen coursing. An accidental rupture of these may give to the contents of the vesicles a hemorrhagic character. Around a patch of closely packed vesicles will usually be found a few outlying lesions, and it is in these that the above-mentioned peculiarities can be best studied.

The course of the disease is a slowly advancing one, with no tendency to heal spontaneously.

No **cause** for the development of lymphangioma circumscriptum is known. The growth is composed of flask-shaped chambers lying in the papillary and deeper parts of the cutis, lined with endothelial cells.

Treatment.—Total destruction is the only treatment which offers any hope of success. Caustics have been used for this purpose, but often the lesions have again returned in the neighborhood or in the original area. In suitable regions the use of the knife, the incision being carried quite far from the borders of the patch, will be found the best treatment. In situations where the knife is not suitable, careful destruction of each vesicle with the electrolytic needle or the galvanocautery is to be recommended.

XERODERMA PIGMENTOSUM.

Description.—According to Kaposi, who first described this formidable affection, the initial lesions consist of reddish-brown to dark-brown spots from the size of a pin's head to that of a lentil, which appear usually in the course of the second year of life, often preceded by an erythema-

tous or measles-like eruption, which comes and goes for a time, to be followed finally by the pigmentation, which is situated upon the face, neck, arms, and legs, or, in other words, those parts of the body that are more or less exposed in infancy. At first the freckles as well as the intervening skin are soft and pliable, but toward the end of the second and in the course of the third year punctiform and linear telangiectases manifest themselves upon and around the freckles, which latter in the mean time have become more numerous. Lentil-sized or larger, white, wrinkled, or desquamating atrophic spots make their appearance, which correspond either to the pigmentations or to the areas between them. The skin loses its elasticity, looks thin and wrinkled, and is devoid of glandular orifices. As a result of this atrophic condition considerable disfigurement is developed in the form of erosion of the lids, xerosis of the cornea, contraction of the nasal and oral cavities, and deformity of the ears. The integument is dry and rough, the scalp is scaly, and pustules and crust-covered ulcers are to be noted, especially about the face.

In a large number of cases certain hypertrophic changes are to be noted, sometimes as early as the fourth or fifth up to the tenth year of life, or they may be delayed until the eighteenth or twentieth, or even so late as the fortieth or fiftieth year. This is the period of new growth. Some of the tumors are benign, some malignant. They generally originate in warty patches that spring from the pigmented spots.

The ultimate result in most of these formations is malignancy of some kind, the most frequent being an epitheliomatous degeneration. After the development of the tumors the length of time the patient may survive is uncertain. Death occurs speedily in some cases, while other unfortunates live many years. Finally, however, they succumb to marasmus, or, directly or indirectly, they die of the terrible ravages of the malady. Of the essential etiology of xeroderma we have little knowledge.

The disease is usually met with in two or more members of the same family, and attacks either sex alike.

Treatment.—The treatment is necessarily symptomatic. Internal medication has proved of no value.

According to R. W. Taylor,¹ who has had an unusual experience with xeroderma pigmentosum, especial care should be taken of the eyes, nose, mouth, and ears, since in these situations the injurious effects of the disease are usually encountered. Pigmented warts should be removed as soon as possible, for fear of ultimate degeneration; and this recommendation holds good for all tumors, large or small.

A. W. Brayton highly recommends curetting the morbid growths and the local application of Fowler's solution as a satisfactory method of preventing further extension of the malignant process.

Jamieson, Allen, and Hyde and Montgomery have reported some encouraging results with the x-ray; others have been less fortunate. As a prophylactic in the young brothers and sisters of patients, one might employ negative phototherapy, that is, the use of red clothing and veils, as suggested by Pusey.

RHINOSCLEROMA.

Description.—This disease, first described by Hebra and Kaposi, usually begins as an extremely hard, circumscribed, nodular or flattened, somewhat elevated, plaque-like growth about the alæ of the nose or the septum. In rare cases, however, it originates in other sites, as in the nasopharyngeal cavity, the arches of the palate or the larynx.

It consists of isolated or aggregated tubercles, of a normal to a dark-brown color, with small bloodvessels ramifying over the surface. It is somewhat elastic to the touch, bound down to the tissues, and of a hardness comparable

¹ American Text-book of Genito-urinary Diseases, Syphilis and Diseases of the Skin, edited by Bangs and Hardaway, p. 1014, 1899.

to that of ivory. The epidermis covering it is smooth and dry, or it may be fissured or even eroded, and covered with yellowish crusts. The hair follicles and sebaceous glands are obliterated. The tumor is, as a rule, not painful except on pressure. Spontaneous involution never occurs.

By encroaching upon the lumen of the nose, which may be entirely occluded, as well as by diminishing the caliber of the larynx, respiration may be embarrassed. If the obstruction be not relieved it may determine a fatal termination. When removed by the knife or caustics the growth recurs quite rapidly.

The active cause of the malady is a capsulated bacillus. Microscopically, the growth is a granuloma.

Treatment.—Permanent removal of rhinoscleroma has never been accomplished, as the tumor always re-forms. Lang obtained a good result by the use, internally and locally, of salicylic acid. Ten grains were administered by the mouth, three times a day, and hypodermic injections of a 1 per cent. solution were made into the growth, while an ointment of the drug was applied to the nares on cotton plugs and a salicylic acid snuff used. Recently cases have been reported which have been improved by radiotherapy. Unless to save the life of a patient from some threatening consequence, such as obstruction to respiration, operative treatment does not seem to be indicated. In such instances the knife, curette, or galvanocautery may be employed.

TUBERCULOSIS OF THE SKIN.

The invasion of the skin by the tubercle bacillus gives rise to a variety of disorders, which, however they may differ in clinical appearance, are due to the same cause. For practical purposes the tuberculoses may be classified as follows: (1) *Lupus vulgaris*; (2) *tuberculosis verrucosa*; (3) *tuberculosis ulcerosa*; (4) *tuberculosis disseminata*; (5) *scrofuloderma*.

Lupus Vulgaris.¹ **Description.**—Lupus vulgaris is an exceedingly chronic tuberculous disease of the skin or mucous membranes that usually commences in childhood.

The affection begins as pin-head sized, or somewhat larger, brownish-red, yellow, or even bright-red spots, embedded in the skin. Their color can be paled but not entirely effaced by pressure. These primary lesions may be elevated, depressed, or on a level with the skin. At this stage of the process the macules may be quite visible to the eye, but inappreciable to touch, and they may be discrete or closely aggregated into flat infiltrations. These macules may also be detected at the periphery of old patches and as redevelopments in scar tissue.

Very gradually, translucent, so-called apple-jelly-like nodules develop, which eventually, in months or years, form one or more dull-red, elevated, somewhat scaly patches. The lupous growth is of soft consistency, not hard like the nodule of syphilis, and can readily be broken down by slight pressure with a probe.

In this form the disease continues for a longer or shorter period, but finally certain retrogressive changes occur. The lupous tubercle (or lupoma) may undergo resorption, and leave in its wake an atrophied, glossy, and scaling surface looking not unlike a burn, and usually presenting a raised edge made up of pale or reddish nodules (lupus exfoliativus, lupus non-exedens). In the majority of cases the lupous infiltration breaks down and ulceration occurs (lupus exulcerans). The ulcerations are seldom painful, are irregular in shape, more often shallow than deep, present a well-defined border and a red, bleeding surface.

¹ Lupus is an extremely common disease on the continent of Europe, relatively frequent in Great Britain, but in our experience rare in the United States, especially among the native-born. We are satisfied that many of the cases of so-called lupus recently published in the journals in connection with x-ray treatment were cases of syphilis or, more generally, epithelioma. In the large dermatological clinic of the Washington University, a patient with lupus is a rarity.

The pus secretion is not profuse, but sufficient to form dirty, reddish-brown crusts. When healing takes place the resulting scars are generally thick and distorted. The course of lupus is always exceedingly chronic, oftentimes years elapsing before any great amount of surface is involved, but eventually its ravages may be appalling. The onward march of the disease is by no means steadily progressive. As the result of various influences, both local and constitutional, its progress may be delayed for awhile, to be succeeded after a variable period by renewed activity, and thus with an advancing line of ulceration in one place and cicatrization in another, or a renewal of the lupus in parts already scarred over, the disorder as a whole discloses a striking clinical picture.

Lupus presents considerable variety in its clinical expression, due in part to the regions attacked, the constitutional peculiarities of the sufferers themselves, and the complications that may arise.

Lupus is not usually symmetrically disposed, although it may become so accidentally. The disease may occur in a single patch, or less frequently in several; on the other hand, there may be many foci of disease (lupus disseminatus). If exuberant granulations form in the lupous patches it is known as **lupus hypertrophicus**, and when the disease spreads by an extending border or the coalescence of one or more patches, it goes by the name of **lupus serpiginosus**. By **lupus papillomatosus** is meant a papillary overgrowth, such as may happen on any ulcerated surface, and in this disease is most often encountered on the extremities.

Leloir describes a form of lupus vulgaris under the title of **lupus vulgaris erythematodes**, which we believe is relatively common, but is usually confounded with lupus erythematosus. It appears as a large or small plaque, occasionally in one, two, or three patches, usually on one cheek, but often invading the nose and both cheeks in a symmetrical manner, just as in butterfly lupus erythematosus.

The face is the usual site of lupus, especially the nose and

cheeks, as well as the ears. The trunk and extremities are also attacked, the hands and feet not infrequently. It is noteworthy that exposed parts are for the most part implicated.

Lupus of the mucous membranes is often primary, and Bender and Finsen have shown that this occurs oftener than has been generally credited.

Various complications may arise in the course of lupus. Swelling and suppuration of the lymphatic glands contiguous to the lupous patches are not uncommon, and chronic enlargement of the parotid has been noted. Erysipelas not infrequently supervenes, and sometimes has a decided curative effect.

It remains to add that there may be grafted on this already terrible disease one more terrible, and that epithelioma often develops on a lupous patch or in the scar of a preceding lesion.

In the great majority of instances, aside from the result of interference with local function, lupus seems to be without prejudicial effect on the general health.

Lupus generally begins in the first decade of life, and rarely commences after puberty, although there are some exceptions to this rule. For some unknown reason it attacks females more often than males.

Careful inquiry shows that a history of phthisis may often be elicited among other members of the family of a lupous patient, and abundant statistics are at hand to prove that secondary tuberculous infection is frequent.

Many carefully recorded cases are in evidence to show that lupus may result from direct inoculation. The bacilli are very sparse and often a large number of sections must be examined before their presence can be demonstrated.

Diagnosis.—In typical cases the diagnosis presents few difficulties; the history of the case, the disease beginning early in life, its great chronicity, and the presence of the characteristic reddish-brown, apple-jelly, readily broken-down tubercles are not easily misinterpreted. There are

several ulcerative diseases, however, that at times bear a fairly close likeness to lupus. The tuberculous and serpiginous syphilides are especially to be differentiated. Lupus begins in early life, and is apt to be definitely localized. Syphilis as usually seen dates from adult life, and the lesions are more widely dispersed. Lupus is chronic in its course; syphilis much more rapid, doing more harm, in fact, in six months, than lupus in as many years; or, as Payne has it, lupus is to syphilis as the hour-hand is to the minute-hand of a clock. Lupous nodules are set deeper in the skin, are reddish brown, and readily break down; the tubercles of syphilis are pinkish-red, firmer, and less irregular in outline. Lupous tubercles often redevelop on the scar left by the disease; syphilitic tubercles rarely if at all.

The ulcers of lupus are not so deep and clear cut as those of syphilis. The secretion from lupous ulcers is scant and inodorous; from syphilis, purulent, abundant, and offensive. The crusts of lupus are thin and reddish; the crusts of syphilis, thick, greenish black, and may have the oyster-shell arrangement. The scars of lupus are thick, band-like, and adherent; in syphilis they are thin, soft, and movable (except in the neighborhood of joints). The osseous tissues are not implicated in lupus; they may be attacked in syphilis. Finally, it is always possible to apply the test of treatment.

Epithelioma might form a source of some confusion, but it must be remembered that lupus begins in early life; cancer of the skin is a disease first occurring, in the majority of cases, in middle age. Lupus will probably exhibit several points of ulceration, and the lupous nodules may be demonstrated; in epithelioma the ulceration starts from a single point, and no apple-jelly lesions are to be seen. In lupus the ulceration extends more superficially than in epithelioma. In lupus the edges of the ulcer are soft and regular, while the edges of the epitheliomatous ulcer are hard and everted, and the base is uneven and secretes a thin, sanguinolent fluid. It is to be remembered that epithelioma

may develop on a lupus. We may entertain a strong presumption in this country, and especially among those born of native parents, that an ulcerative process, say on the face, is **not** lupus, but probably epithelioma or syphilis, and the former more particularly if occurring first in middle life.

The ulcerations left by broken-down glands and the accompanying chronic inflammation of the skin in their neighborhood, may suggest lupus, but the absence of lupous nodules and the presence of sinuses and enlarged glands elsewhere would be sufficiently distinctive.

Lupus erythematosus is usually symmetrical, commences later in life, and is much more rapid in its course than lupus vulgaris; besides, there are no ulcerations and no apple-jelly nodules in the first-named trouble, and the scales are fatty and dip down into the sebaceous orifices.

Crocker regards tuberculin injections as a valuable aid in diagnosis. Two milligrams may be first tried, and then 0.005 or even 0.01 gr., and the smaller the dose that produces local and general reaction the more likely is the disease to be lupus vulgaris. A large dose (0.01) may perhaps produce slight local reaction in lupus erythematosus, but not in syphilis or epithelioma. It is of no diagnostic value in lepra or scrofuloderma, because, according to the same authority, the distinction between lupus vulgaris and the latter is of no practical importance, while lepra may react altogether too violently. An opsonic determination (see Part II) may also be made for its diagnostic significance.

Pressure with a dioscope (a microscope slide or watch-crystal will do) is an important aid to diagnosis. By this procedure it is possible to distinguish between an inflammatory lesion and a lupous infiltration.

Erythematoid lupus vulgaris bears a strong likeness to lupus erythematosus, but the presence of lupous nodules and the other features mentioned above should be sufficient to prevent mistakes.

Treatment.¹—Persons suffering from lupus may often be greatly benefited as to their local condition by appropriate hygienic and general treatment; that is to say, while no manner of internal medication will cause the disappearance of an existing infiltration, it may be made more amenable to appropriate local measures, and to display less destructive tendency and less proneness to relapse. In suitable cases the open-air treatment and appropriate diet may be ordered, exactly as in tuberculosis of the lungs.

On the other hand, cases are not infrequently encountered in which there is no apparent demand for internal medication, the patients possessing good general health.

The specific treatment of lupus with tuberculin has not come up to the expectation of its early advocates, nor, on the other side, is it as absolutely valueless as some have presumed. Morris says that a course of tuberculin injections should be preliminary to the treatment of lupus by any of the local methods, as it seems to make the disease more amenable to these measures. Crocker says that it will remove the fibroid thickening that is often seen about the lips and where there is much lax tissue, and that, moreover, after as much lupous tissue has been removed by erosion as possible, it will dissipate some of the tissue that has escaped destruction from without, and in this way secure a longer period of abeyance and a greater degree of permanent cure. M'Call Anderson² is thoroughly convinced of the great value of tuberculin in lupus and other tuberculous affections. He thinks that it is important to observe the following rules in carrying out the treatment:

1. The initial dose of the old tuberculin, in the case of an adult, should not generally exceed $\frac{1}{2}$ c.c. of 1 in 1000, and sometimes it is safer to begin with $\frac{1}{4}$ c.c.

¹ The two best expositions of the modern treatment of lupus, the result of wide experience, are those of Radcliffe-Crocker in the third edition of his text-book, and the admirable paper read by Malcolm Morris before the Fifth International Dermatological Congress (Lancet, October 22, 1904). For the facts and conclusions that follow we are largely indebted to these authorities.

² British Journal of Dermatology, September, 1906.

2. If a given dose yields little or no result, it is usually safer to give a second of the same strength as the last, because the latter often acts much more evenly than the former.

3. The more pronounced the constitutional reaction, the longer should the interval be before the following injection; an interval of several days of apyretic temperature at least.

4. Much greater care must be exercised in increasing the doses at the earlier than during the later periods of the treatment, because the system gradually gets acclimated to it, so much so, indeed, that, while an initial dose of $\frac{1}{2}$ c.c. of 1 in 1000 may raise the temperature to 103° or 104° , the final dose—say of 1 c.c. of pure tuberculin—may have no result at all.

Today, however, all such counsel loses much of its value in view of the far more exact, safer and more efficient indications furnished by the opsonic method. (See Part II.)

Thiosinamine has been recommended by H. von Hebra for a similar purpose. As to its permanent effect upon the disease, very little can be said, but there seems to be little doubt as to its value in removing cicatricial thickenings, and thus restoring the mobility of the joints and other parts. Intercurrent attacks of erysipelas have also a decided influence over the lupous process, as we can testify from experience, but the best authorities oppose the intradermic injection of erysipelas toxins (Besnier, Thibièrege).

The action of drugs having a marked local reaction, perhaps produces similar results.

Crocker states that thyroid feeding is the most important adjuvant to surgical or other local means that we possess. It should be given after as great an amount as possible of tissue has been removed by local measures, beginning with 5 gr. of the desiccated gland. After a fortnight 2 gr. may be given, and if the patient tolerates it the thyroid may be given in doses of 15 gr. per diem. Tabloids are the form of administration preferred. As it has to be given for

a year or more, great care should be taken to secure the proper dosage, since serious symptoms may arise at times.

Morris, Pringle, and others speak highly of thyroid feeding in proper cases. Many other methods of treating lupus constitutionally have been recommended, as, for example, injections of mercurial salts.

Whatever may be the future of the internal treatment of lupus, it remains true that **local measures** of relief are paramount in importance. The object of local treatment is to remove the diseased tissue, and, incidentally, to accomplish this with as little deformity as possible. The measures, medical and surgical, recommended to attain these desirable ends are almost numberless. In the choice of a method the surgeon must take into account the stage, the extent and the location of the disease, and must be well acquainted with the effects that will follow upon a particular operation.

In most instances, an energetic treatment is demanded from the beginning. The local measures that have been recommended from time to time are innumerable, but today, for the most part, they have taken a place second in importance to that of the light treatment of Finsen and radiotherapy. Yet the older methods have their place in the therapeutics of lupus, and are of the greatest value in properly selected cases. These methods will now be considered briefly:

Surgical Methods.—Of the various surgical methods of treating lupus, **excision** as practised by Lang and others occupies the front rank. Morris states that if carried out with thoroughness it gives better results than any other plan of treatment. The incision should be carried well beyond the apparent margin of the affected area and be of a sufficient depth to remove all of the infiltration. Whitfield lays especial stress on making it deep enough to include the whole of the fatty layer. The wound if small may be closed by sutures, or, if large, skin-grafting by Thiersch's method may be employed.

The operation of excision is mostly limited to small patches, if on uncovered parts, but it may be more boldly used in situations like the trunk or limbs.

Multiple punctiform scarification is now but little used, either as an original procedure or as supplementary to erosion. **Linear scarification**, which consists in making a series of parallel cross cuts with the object of destroying the nutrient vessels of the part, is a far superior operation, and, while excessively tedious, is capable of producing very satisfactory results, although relapses are just as common after it as from any other operation. For ulcerating lupus of the nose or face it has a distinct advantage, as it is not apt to be followed by any deformity.

Heretofore in our own experience, **erosion** with the **sharp spoon** or **dermal curette** has been the method of choice.

Local anesthesia may be produced or the patient put under ether. The hand soon learns to distinguish between healthy and diseased tissues, especially as the latter come away readily. Hemorrhage is easily controlled by pressure with absorbent cotton. The after-treatment of the scraped surface varies with different operators. Volkmann was in the habit of making multiple punctures, so as to ensure complete destruction of all suspicious points. Crocker's plan, where there is much cicatricial tissue, is to mop on strong carbolic acid, or, if the disease be on the limbs, to apply strong sulphuric acid with a piece of wood, and then neutralize with bicarbonate of soda. Boric lint or sal-alembroth wool is then bandaged firmly on to stay the bleeding, and replaced in a few hours with wet boric lint covered with oiled silk, and after a day or two the wound is dressed with boric acid salve. This same excellent authority states that he gets better results where tuberculin has been injected as an after-treatment until the wound heals. Mr. Morris says that Sir Joseph Lister, after scraping and the cessation of hemorrhage, fills up the holes with fuming nitric acid, followed presently by a neutralizing solution of soda. The wound is then dressed in the usual way. T. C. Fox uses a cream of chloride of zinc in spirit for the same ends, and Jamieson goes over the surface with a probe on which has been fused some chromic acid—a plan of which we can speak highly.

The **galvanocautery** is strongly recommended by Besnier as a valuable direct method and, moreover, as obviating the possibility of auto-inoculation which may follow the bloody operations.

Authorities differ much as to its value. Crocker limits its application to recurrent nodules and lupus of the mucous membranes. Morris declares that the galvanocautery is still the best method at our disposal in cases in which it is not practicable to apply the Finsen light or the x -rays, particularly for small growths.

There is little question, however, of the value of the galvanocautery for lupus of the mucous membranes, and in many situations it is the treatment of choice (Brocq).

The Paquelin cautery and the hot-air treatment of Hollaender may be also mentioned in this connection.

Medical Methods.—In a small proportion of cases soothing remedies are useful and tend to promote involution of the disease. For non-ulcerated surfaces Crocker recommends the familiar calamine and zinc lotion, and where the skin is unbroken the writers have seen benefit from the unguentum vaselini plumbicum, to which has been added about 10 per cent. of aristol or xeroform, preferably the latter. In superficial forms of the disease Brooke's ointment does excellent service, and acts much better than the usual mercurial plasters:

R—Hydrarg. oleatis (2½–5 per cent.).	3j
Acidi salicylici	gr. x–xv
Ichthyolis	ʒi
Olei lavandulæ	q. s.—M.

S.—Rub in with steady friction ten to twenty minutes, morning and evening. The skin must not be broken by the application; if, however, this should occur, the salve must be diluted or the parts dressed with a boric acid salve until it has re-formed.

Such applications, properly speaking, are merely adjuvants, but among the active agents **salicylic acid** has been much employed. It may be used, as suggested by Treves, made into a cream with glycerin, to which is added a small amount of creosote, or in the shape of Unna's plaster mulls. These plasters may be renewed once, or, where

there is much exudation, twice daily. They are made of different strengths, and Jamieson recommends that the treatment should be begun with as strong a plaster as the part will bear. The incorporation of the creosote with the salicylic acid materially lessens the pain. The results obtained are often very satisfactory, but, as in most other procedures, new nodules are apt to develop, and these must be destroyed in the manner presently to be described.

Pyrogallol has a selective action for lupous tissue, and if not used over too extensive a surface gives good results. It may be applied as a 10 per cent. or stronger plaster mull or ointment, or as a saturated solution in ether. In the latter case it should be covered over with traumaticine, and reapplied until all of the nodules have disappeared.

Jarisch first recommended a 10 per cent. pyrogallol salve after curetting, to be followed in some days by iodoform, and when healing began the application of mercurial plaster to secure a good scar. G. H. Fox uses a much stronger salve—25 to 50 per cent.—as it shortens the duration of the treatment, and is decided in his recommendation of this mixed method. In the treatment of small patches we have been in the habit of using a thorough electrolysis, followed by curetting and the subsequent application of chromic acid.

Permanganate of potassium in 10 per cent. strength, painted on daily or every other day, has been recommended by Schultz. The nodules break down under its use, and, it is claimed, can be readily wiped away with absorbent cotton.

Mercuric chloride, 1 or 2 gr. to 1 oz., in solution or in ointment, is recommended by White for continuous application.

This list might be indefinitely extended, but we believe that there is a well-grounded belief that such remedies are too often followed by relapse and find their chief utility as auxiliaries to more radical measures.

Among the more decidedly **caustic remedies** may be mentioned arsenical paste, nitrate of silver in stick or solu-

tion, and lactic acid, the latter especially for small ulcerations and lesions of the mucous membranes. Whitfield considers zinc chloride, freshly ground up with glycerin and water into a paste, so far superior to all other agents that he uses it alone.

Freezing with ethyl chloride has been employed. Pusey suggests solidified carbon dioxide or liquid air for the same purpose in dealing with discrete nodules or small patches.

Recurrent nodules may be destroyed by electrolysis, as recommended by one of us¹ many years since, by the dental burr of Fox, the double screw of Morris, or by boring in with a toothpick dipped in acid nitrate of mercury, or by the thermocautery. The "thorn treatment" of Unna consists in applying the liquor antimonii chloridi by means of the thorns of the gooseberry bush, which are thrust into the nodules and then cut off and allowed to remain in position until they come away.

The Finsen Light.—What is known as the Finsen treatment consists in concentrating the chemical rays of light on the diseased area and cutting off the heat rays by suitable means as far as practicable. At the same time the parts to be acted upon must be rendered bloodless by deep pressure. Cure is thought to be due to the bactericidal effect of the chemical rays.

The technique of the procedure has been considered elsewhere (see Phototherapy, Part II); in this place the general results of the light treatment will be presented. Briefly stated, it is claimed that phototherapy gives more satisfactory results than any other form of treatment, especially in dry and non-exedent cases, and that the cosmetic effects are greatly superior. Statistics would seem to have proved the first contention, and personal observation the second. It does not follow, however, that the light treatment is equally applicable to all cases. It is contra-indicated in long-standing cases that have been much treated,

¹ Hardaway.

and where there is much scar tissue present. It is not applicable to the mucous membranes, nor to situations where it is difficult to press out the blood from the tissues. It is often necessary to combine other forms of treatment with the use of the light, as, for example, applications of pyrogallol, erosion, and the x-rays. The chief objections to phototherapy are the time required—many months in extensive cases—the cost, directly and indirectly, and in this country especially, where lupus is uncommon, the difficulty of securing the true Finsen treatment in all its rigor.

Statistics from the Finsen Institute for a period of seven years show 737 cases treated: 412 cured, 192 nearly cured, and 91 others progressing favorably. Of the 412 "cured," 124 had remained free from recurrence during periods of observation ranging from two to six years. Only 42, or 6 per cent. of the whole, gave unfavorable results. At the Hôpital Saint-Louis, with an inferior lamp, 30 cases gave 11 complete and 12 partial cures. At the London Hospital, up to 1903, there were treated 398 cases, of which 149 were discharged as cured.

G. H. Graham believes that the injection of a fluorescent body, such as esculin, enhances the action of the light. Forchhammer failed in 23 cases in which he used a 1 to 1000 solution of erythrosin subcutaneously. Tappeiner paints on a 0.01 to 0.1 per cent. solution of eosin before exposure.

Exposures of from three-quarters of an hour to an hour and one-half with a Finsen or Finsen-Reyn lamp, are repeated once or twice, allowing intervals of about ten days for subsidence of the reaction, which varies from an erythema to a vesicular or bullous dermatitis. Daily *seances* are given in extensive cases, a different area being treated each day. In superficial cases the London or the iron-electrode lamp may be used at first, to be followed by the Finsen or Finsen-Reyn lamp for the deeper-lying parts.

The x-rays should not be used to supplant other methods, but as an adjuvant to them. Few cases can be brought to

a real cure by the use of the rays alone, and even in these much time can be saved by an intelligent use of the older methods. In certain forms of the disease, as for instance in small patches of non-exedent lesions without much cicatrization, erosion, cauterization, or electrolysis are to be preferred. The x -ray is best adapted to hypertrophied and sclerosed lesions, to ulcerated cases with deep scarring, to isolated scattered nodules, and to mucous surfaces.

Scholtz believes that ulcerated cases should be first treated by pyrogallic ointment in increasing strength, to be followed by irradiation. Deep cases should be curetted and cauterized with hot-air at first, then the x -rays should be used together with a pyrogallic ointment, and lastly light rays.

X -rays present the following advantages over phototherapy: Compression of the surface, a painful procedure, is unnecessary; treatments are less frequent and less prolonged; a larger surface may be attacked at one sitting; the x -rays being more penetrating, and deeper portions can be attacked, whereas a cicatricial layer will arrest the chemical rays.

On the other hand, radiotherapy is more dangerous to the integrity of the skin, and the statistics are not quite so good as those of phototherapy at its best. Morris and Dore, Harrison and Wills, of Bristol, and Schamberg prefer phototherapy to the x -rays, except on mucous surfaces. This method, like all others, shows a certain proportion of recurrences.

Technique.—The older method was to set up a violent inflammation and thus secure necrosis of lupous nodules. Most operators today are content to excite a mild erythema with increased leukocytosis.

Albers-Schönberg commences with ten-minute sittings, two or three times a week, and gradually increases the time.

Williams pursues a similar plan. Scholtz, while admitting that this method may be best adapted to some cases, here as elsewhere prefers more heroic treatment. He

indeed deprecates the production of deep destructions, but says: "We do not understand why operators are so anxious to avoid superficial ulceration of the skin. Intense irradiations are most efficacious in severe forms of lupus and many other diseases."

Kienböck gives a "normal" dose of 3 or 4 H. at intervals of one or two months in hypertrophic cases, later employing phototherapy. In ulcerative cases he prefers phototherapy from the first, as does Jamieson. Holzknacht precedes the lamp by the tube.

Pusey's brilliant successes in this disease have been won by the patient use of mild exposures frequently repeated. One of us secured a cure after two years' treatment by weak, frequently repeated doses, in a case which had existed for fifty-seven years, deeply ravaging the whole face. A burn being (undesignedly) produced on one cheek, a papillary epithelioma developed at the exact centre of the burned area. This was excised and has not returned. McLeod and Da Costa have had similar experiences.

We do not know that we can do better in this connection than to quote literally from Malcolm Morris' recent paper¹ on the treatment of lupus during the last twenty-five years.

For purposes of treatment, by the methods under consideration, Morris divides lupus into five classes as follows:

1. **"Cases of Small Extent in which No Previous Treatment has been Employed.**—In such cases Finsen's method is the best, as it leaves little scar and gives as permanent results as severer methods. The *x*-ray is also useful under these circumstances, but the time required is relatively longer owing to the difficulty of eliminating residual nodules, and it is possible that a telangiectatic scar may follow the application.

2. **"Cases of Small Extent with a Dense Fibrous Cicatrix due to Previous Treatment.**—Both the Finsen method and the *x*-rays are tedious if applied in the usual manner, but

¹ Lancet, October 22, 1904. Read before the Fifth International Dermatological Congress.

repeated applications to the same area, without allowing healing to take place between the applications, are more efficacious, although more painful.

3. **"Cases of Large Extent in which Lupus is Relatively Superficial or the Nodules more or less Discrete.**—In cases of this kind it is better to begin with the x -rays and to finish with the light rays. More rapid results are obtained by the concurrent use of Röntgen and Finsen rays. The whole area should be exposed to the x -rays and the edge treated by light.

4. **"Cases of Large Extent in which there is a Dense Mass of Lupous Infiltration and Fibrous Tissue.**—Here neither the light nor the x -rays make much impression. Probably vigorous preliminary surgical measures such as excision or scraping, followed as soon after as possible by the x -rays and again by the Finsen light if necessary, would considerably reduce the duration of treatment and give better results than those obtained from the x -rays or the Finsen light alone.

5. **"In Lupus of Mucous Membranes** great initial improvement follows the use of the x -rays, but relapses are frequent. In the upper parts of the nasal fossæ radium might be of use. I have had very little or no experience of this agent. Galvanocautery is of service in such cases.

"To sum up, the combination of Finsen's methods with the x -rays, reinforced when necessary by the use of pyrogallic, salicylic, or carbolic acid or other caustic applications, has, in my experience, given good results in cases of lupus in which the disease is not very extensive and does not spread too rapidly to be overtaken by treatment. Vigilant supervision is necessary to detect any appearance and to destroy fresh nodules in the earliest stage of their development."

Radium.—This agent has been but little employed in lupus owing to certain practical difficulties. Norman Walker states that he can speak highly of its value in small patches of lupus of the skin, and more particularly in lupus of the palate.

Prognosis.—A very guarded opinion must be expressed in regard to the prognosis of lupus, for under any form of treatment now known relapses of the process are the rule. Naturally, also, the various circumstances of age, location, acuteness, extent, and duration must be taken into account. The results of treatment are more satisfactory in elderly people than in the young, and limited superficial areas of the disease may be permanently cured. Although lupus is exceedingly chronic in its course, often lasting twenty or thirty years, it is rarely inimical to the general health, certainly in this country, but it would seem from foreign statistics that general tuberculous infection is more frequent than was formerly supposed.

Tuberculosis Verrucosa. **Description.**—The anatomical wart or *verruca necrogenica* commences as a small, flat infiltration on the knuckles or between the fingers, and soon becomes pustular. Finally, the surface becomes irregular and warty and presents the type of a papilloma. It is not uncommon on the hands of those engaged about the dissecting room or in making postmortem examinations. The condition is usually benign, sometimes undergoing spontaneous cure, but occasionally lymphatic involvement and constitutional infection may occur.

Under the name of *tuberculosis verrucosa cutis* an allied disorder has been described, due to infection with tuberculous matter.

It is rare on the palms, but is met with generally on the backs of the hands and the interdigital spaces, just as in the anatomical tubercle. It occurs in large and small warty patches, round, oval, or serpiginous. These patches extend peripherally, and are surrounded by a bright erythematous areola, within which may be detected a zone of small scattered pustules seated on a brownish or livid infiltration. The middle of the patch is made up of uneven and warty growths, which are covered with crusts, and, as is usual with such formations, pus may be made to well up from between the papillomata. The affection disappears by flattening of the central verrucæ and drying up of the

pustules; a pliant, thin, sieve-like scar results. Tubercle bacilli have been demonstrated in the granulation tissue and in the giant and epithelial cells of the caseous nodules.

Other forms of this type of tuberculosis have since been recorded.

Treatment.—The treatment is essentially the same as that for lupus vulgaris. Erasion with the curette followed by the thermo- or galvanocautery is usually effective.

Ullmann believes that the *x*-rays yield better results in verruca necrogenica than in lupus. Zeisler, Campbell, and others have met with success in its use. Phototherapy has been commended. Gottheil gives it the preference.

Tuberculosis Ulcerosa. Description.—This condition, also called tuberculosis cutis vera, occurs on persons who are the subjects of general tuberculosis. It has its origin at the mucocutaneous outlets, namely, the lips, anus, vulva, etc., whence it spreads to the contiguous skin. The lesions are painless and occur in the form of shallow, isolated ulcers with slightly infiltrated edges, and reddish-yellow floors covered with a thin secretion.

Treatment.—The treatment is that of the general disease upon which the ulcers depend.

Locally, cleansing lotions and gently stimulating applications are of temporary value. Lactic acid, usually somewhat diluted, is a good application.

The curette and galvanocautery may occasionally be employed. Gottheil considers phototherapy the best treatment.

Tuberculosis Disseminata. Description.—Various cutaneous lesions, macular, papular, vesicular, ulcerative, etc., acute or subacute, have been observed in children suffering from scrofulosis; and there is another form of disseminated tuberculosis of the skin, known as **exanthematic miliary tuberculosis**, which follows in the wake of the eruptive fevers of childhood and is due to the same general condition.

Treatment.—The treatment of these cutaneous tuberculosis is the treatment of the condition upon which they depend.

Scrofuloderma. **Description.**—The most frequently encountered form of scrofuloderma has its origin in the lymphatic glands in the neck, and more rarely in the axillary and inguinal regions. The glands may be felt under the skin as numerous, rather firm and movable bodies which grow but slowly and are always indolent. Sometimes several glands attain a considerable size—one inch or more—or an agglomeration of glands may be detected, but, it is said, without becoming fused or matted together (Eve). The glands may remain as indolent nodules for an indefinite period, or they may undergo resolution without suppuration.

Suppuration is, however, the usual termination of the process, the overlying skin meanwhile becoming thinned and of a violaceous color. When the abscess bursts it emits a thin, curdy pus, more or less mixed with blood. Sinuses and fistulous tracts form; the skin is undermined and perforated, and strumous ulcers are developed.

The cicatrices that result from the healing process are bound down to the underlying tissues, ridged and knotty and often hypertrophic. The course of the affection is exceedingly slow, ulceration and repair going on hand in hand for months.

There is also a variety of scrofuloderma—the so-called **scrofulous gumma**—which begins in the form of bean-sized nodules that gradually enlarge to hazel- or walnut-sized tumors, and are unaccompanied by subjective symptoms. They may or may not suppurate; in the former case there will be present typical strumous ulceration, or, on the other hand, their contents may be resorbed. These gummata may also occur along the course of the lymphatics of a limb (Hallopeau).

Scrofuloderma is observed in both sexes. It is very common among negroes in this country. Scrofula is a disease of early life, although it may occur in aged people.

Pustular Scrofulides.—Duhring describes a cutaneous manifestation which consists of one or more large, flat pustules seated upon an inflamed or violaceous base.

The crust forms slowly, is thin and flat, and of a brownish color. The ulceration beneath has the "peculiar scrofulous character," although the scars are soft, flat, and superficial. The same observer calls attention to another variety of disease, observed in scrofulous subjects, which declares itself in the shape of small pin-head to pea-sized, disseminated, yellowish papulopustules, upon a base similar in character to that found with the large pustular lesion just mentioned. The lesions occur for the most part on the face and extremities, and leave punched-out, variola-like scars. The process may continue for years.

Associated with the ordinary expressions of the scrofuloderma may be found lupus vulgaris, tuberculous dactylitis, and certain forms of cutaneous disease, as lichen scrofulosus, various pustular eruptions and the erythema induratum of Bazin.

Treatment.—The constitutional treatment of scrofuloderma should be directed to the improvement, in every way possible, of the patient's nutrition.

Cod-liver oil, malt, iron, especially the syrup of the iodide, the hypophosphites, and the lactophosphate of lime are all valuable remedies. Arsenic is praised by Buchner and Eve. Good, nourishing food, appropriate exercise, well-ventilated sleeping apartments, residence in the country or at the seashore, together with all other suitable hygienic measures, are of the utmost importance.

Ringer, Crocker, and others advise sulphide of calcium for the multiple cold abscesses. Crocker especially recommends chaulmoogra oil in the form of an emulsion in from 10- to 30-minim doses, and an ointment externally. G. H. Fox has seen good results from the internal use of iodide of starch in strumous subjects.

Treves very wisely states that in treating any case of gland disease the first rule is to remove all sources of peripheral irritation, viz., disorders of the eye, mouth, pharynx, or skin. To promote resolution this authority highly recommends the unguentum plumbi iodidi.

The local treatment is mostly surgical. Broken-down

glands, sinuses, and ulcers should be thoroughly curetted, touched with pure carbolic or lactic acid, and afterward dressed with iodoform. Treves uses a fine point of the thermocautery, which is thrust through the skin into the substance of the gland, and is passed in several directions through the gland tissue before it is withdrawn. Excision gives good results in suitable cases; that is, in those instances in which there are present two or three movable and superficially seated glands, or in chronic circumscribed enlargements that have resisted other methods of treatment (Eve).

Zeisler, Bishop, Williams, and others have obtained as good results by the *x*-rays in the treatment of this disease as in lupus. The Finsen light has been recommended.

LICHEN SCROFULOSUS, OR SCROFULOSORUM.

Description.—This disorder is exceedingly rare in this country. The following description is condensed from Kaposi's text-book: The eruption is made up of pale-red to brownish or livid-red papules, millet-seed to pin-head sized, arranged in groups and patches varying in circumference from a dime to a dollar, and also here and there presenting circles and curves. The lesions are capped with a small scale and more rarely with a minute pustule. There is but slight pruritus. They remain for years almost unchanged, then finally undergo involution with slight desquamation and fading color, and show no evidence of their previous existence. The usual seat of the eruption is the trunk, back, and abdomen. In the beginning the patches are isolated, but later adjacent groups may coalesce and give the appearance of a diffuse disease, at whose borders the skin is of a dirty-brown color and covered with thin, detachable scales. But even under these latter conditions the original grouping and lesional features may be demonstrated. About the openings of the sebaceous glands there are also, as already stated, papules arranged in circular lines. Rarely, through involution and evolution of the papules, serpiginous forms

may be observed; after months similar lesions appear on the flexor sides of the upper and lower extremities and also on the face. In some cases eczematous and pustular eruptions may arise as complications. Nodules and pustules surrounded by a hemorrhagic areola may appear on the lower limbs. Some 90 per cent. of these patients suffer from glandular swellings and other scrofulous manifestations. The majority of the cases occur at or before puberty. While the histological architecture of these lesions, according to McLeod, "does not do more than suggest a form of tuberculosis," yet several observers, among whom Jacobi and Pellizari, have demonstrated in them the presence of tubercle bacilli, and made successful inoculations.

The disorder should be differentiated from papular eczema and the small papular syphilide.

Treatment.—The treatment consists in the **internal** use of cod-liver oil, with or without iodide, and the **inunction** several times daily of cod-liver oil. Under this management improvement is rapid.

Crocker states that inunctions of plain vaselin, or vaselin with 5 gr. of thymol to 1 oz., give as good results as the more disagreeable cod-liver oil applications.

ERYTHEMA INDURATUM.

Description.—Under the name of erythème induré des scrofuleux, Bazin originally called attention to a disorder that is most frequently seen in delicate young girls, or women under thirty years of age. The disease first shows itself in the shape of several hard indurations of the skin, which can be more readily felt than seen. These nodules are generally found on the legs, and especially just below the bulge of the calf; they have, however, been also observed over the leg generally and on the thigh. When a number of lesions are present they coalesce into brawny patches, and in the course of time the skin covering the

infiltration becomes red and then violaceous. Involution may take place after a considerable time, or else the induration may slough out, leaving indolent ulcers that are slow in healing. There are no symptoms of acute constitutional disturbance, but there is occasionally some pain in the limbs. Its chronicity, the small number of nodules present at first, and the freedom from systemic disturbance, distinguish this disorder from erythema nodosum. The disease is most often mistaken for syphilitic gummata, but the absence of specific history and concomitant symptoms, the evolution of the disease, and, above all, the failure of antisyphilitic treatment, usually suffice for the diagnosis. The **etiology** of the disease is obscure. Experimental inoculation has yielded contradictory results, so that while it is apparently proved that some cases are due to the presence of tubercle bacilli, others may be caused by the toxin alone.

Treatment.—The essential features of the treatment are rest in bed, proper bandaging, and the administration of cod-liver oil or malt extract with the hypophosphites. The ulcers may be dusted with aristol or xeroform, or other similar preparations. Stelwagon advises that the whole surface of the leg should be washed with a saturated boric acid lotion containing 3 to 10 gr. of resorcin to 1 oz., and when patients are not in a position to secure absolute rest, he puts on a zinc and ichthyol gelatin dressing, leaving windows over each ulcer as in varicose eczema. Hutchinson recommends an ointment of 5 gr. of bisulphuret of mercury to 1 oz. of benzoated lard.

BLASTOMYCOSIS.

Description.—Blastomycosis is a rare, chronic, infectious disease due to a yeast fungus, the blastomyces, and is characterized by verrucous, granulating patches studded with minute abscesses.

The disease begins as a papule or papulopustule which

is soon covered by a crust. As the lesion slowly enlarges, it takes on the appearance characteristic of the disease. It requires several months to attain to a diameter of one inch, often after years growing to the size of a silver dollar or the palm, and in rare instances much larger, and to an elevation of from one-eighth to three-eighths of an inch. In about one-half of the cases additional foci appear. Occasionally the lesion heals spontaneously. The resultant scar, except in cases that have been deeply cauterized, is smooth and not especially disfiguring. Pain is slight or absent and the general health, as a rule, unimpaired, although three cases have succumbed to systemic blastomycetic infection.

The disease more often appears on the face, a patch immediately below the orbit and involving the lower lid being especially characteristic. The cheek, temple, and lips have been invaded. Other regions, in the order of frequency, are the hand, leg, thigh, foot, scrotum, and upper part of the back.

Hyde gives the following description: "There was always the slightly elevated border, well-defined, sharply raised, composed of minute verruciform elevations commingled with small, yellow points from which pus could be expressed. On the side of the sound skin there was always the bluish-red, sloping border, close inspection of which revealed pin-point-sized abscesses not very thickly set, and on the inner or morbid side of the enclosing wall was either a moist, granulating surface, or a partly cicatrized, reddish disk, with here and there projecting areas made up of verrucous elevations, similar to those recognized in the surrounding ridge."

Diagnosis.—The papillomatous lesions of this disease bear some resemblance to fungating epithelioma or syphilis, but differ from these by the minute, warty points, interspersed with miliary pus collections, along the well-defined, sharp border, and the bluish-red, sloping zone beyond. The greatest resemblance, however, is to tuberculosis verrucosa.

Hyde gives the following points of difference: "The

latter is usually single, while blastomycetic dermatitis at one time or another exhibits multiple invasions. Tuberculosis verrucosa rarely occurs on the face, which is the site of election in the disease under consideration. The potassium iodide has a marked effect on blastomycetic lesions, but not in the other disease." In some cases the microscope alone can decide. To the contents of one of the miliary abscesses, or a bit of teased tissue, a drop of a 20 or 30 per cent. solution of potassic hydrate is added. In from ten minutes to an hour the pus cells or tissue will have disintegrated and the spherical-budding organisms will be easily visible.

Prognosis.—Most cases do well under the treatment outlined above, although recurrences are common even in apparently good scars. Fatal, systemic infection has been observed, as noted above.

Treatment. Internal.—Bevan introduced the use of potassium iodide internally. This agent brings about marked improvement, and in rare instances has wrought a cure, although daily doses of from 200 to 500 gr. are sometimes necessary before the change is appreciable. In most cases there is for a time rapid amelioration under the iodide, but isolated patches remain, and as soon as the drug is discontinued the disease resumes its former activity. Copper sulphate has recently been suggested, given in the doses of $\frac{1}{4}$ gr. increased to 1 gr., three times a day.

Local.—Hyde recommends cleansing, antiseptic lotions, or dry dressings. Complete excision when practised has been followed by permanent cure, while curetting has only attained temporary results. Hyde, Pusey, Fischkin, Williams, of Boston, and Heidingsfeld have had good results from a combination of potassium iodide and the x-rays.

LUPUS ERYTHEMATOSUS.

Description.—Lupus erythematosus is a cellular infiltration of the skin, characterized by erythematous patches of various sizes and shapes, generally decked with grayish

or yellowish adherent scales, and displaying a tendency to superficial scarring.

There are several clinical varieties of the disease recognized by authors. By far the most common is the **discoid** or **circumscribed** form, in which the primary or eruptive lesion is from pin-head to pea-sized, slightly raised, and which presently becomes covered with an adherent scale. These spots may be isolated or grouped, few or many, but gradually, by peripheral extension and coalescence, they come to make variously sized and shaped, erythematous, scaly patches that are characteristic. The patch is pinkish, reddish or purplish in color, and the surface is in some cases covered with scanty adherent scales, or else with thick, yellow and sebaceous-looking crusts, or in still other instances the lesions are frankly erythematous and free of scales. The patch spreads peripherally, and finally exhibits a depressed, atrophic centre, with a raised border, studded with comedones or showing small, patulous openings. There may be one or more such lesions present, varying in size from that of a pea to that of the palm.

The progress of the disease is usually very slow, often extending over years, but occasionally the evolution is much more rapid. After awhile the affection ceases to spread and comes to a standstill, or involution may be complete and nothing remain but a superficial or deep, usually punctiform, scar. When hairy parts are affected the hairs fall out as the result of follicular atrophy. The usual seat of the disease is upon the face, especially over the bridge of the nose, and also the tip and alæ, on the cheeks, eyelids, scalp, and ears. One of the most characteristic types of the affection is exhibited in the so-called butterfly or bat-like form, produced by coalescence of patches on the bridge of the nose and on the cheeks under the eyes. Other parts of the body may be affected, and attention has been called to lupus erythematosus of the hands and feet, and also of the mucous membrane of the lips, mouth, and conjunctivæ.¹

See Thomas Smith, *British Journal of Dermatology*, February, 1906.

The subjective symptoms are not marked and, at the most, consist of slight burning or itching. In the ordinary forms of the disease, to which the description just given applies, the patients are in the enjoyment of general good health.

In the form of the disease called **lupus erythematosus disseminatus** there are many aggregated or discrete, usually erythematous, primary eruptive spots, which, unlike the discoid variety, spread by the multiplication of these lesions, and not by their coalescence; and thus, by the appearance of new patches among the older, large surfaces may be involved, and almost any part of the body occupied by the eruption.

Grave constitutional and local disorders may complicate this affection, and a fatal termination has ensued in a large proportion of the cases. One of us reported two instances of this formidable disease, both ending in death.¹ There is a strong suspicion in our minds that these cases, like some of the discoid forms, especially the indurated, unsymmetrical variety—the *lupus érythémateux fixe* of Brocq—are really examples of cutaneous tuberculosis.

Crocker describes a **telangiectatic** and a **nodular form**. In the first-named variety there is a chronic, erythema-like redness, due to dilatation of vessels, accompanied by considerable infiltration, and later, by superficial scarring. It may be single, but usually occupies both cheeks. We have also seen it in the form of disseminated patches. The second, or nodular variety does not present a very definite clinical picture, and would seem to consist of brownish-red nodules, not unlike *lupus vulgaris*, but which from their course and general behavior bear a resemblance to *lupus erythematosus*.

Lupus erythematosus is much more common in women than in men, and usually first makes its appearance between the ages of eighteen and forty, although a few cases in children have been recorded. The **etiology** of the disease

¹ Hardaway, *Journal of Cutaneous Diseases*, December, 1889, and July, 1892.

is very obscure, but it is likely that both debilitating influences and local irritations predispose to it. For example, Hutchinson and others state that a history of phthisis in the family is often obtainable, and it is undoubtedly true that tuberculosis is often associated with the disseminated type. It would seem that uterine derangements and chlorotic states often exist as antecedents or complications; and, moreover, heat and cold and the various agents that dispose to seborrhea are undoubted exciting causes. Wilfrid Ward has shown the frequent connection of lupus erythematosus with hypertrophic and atrophic rhinitis, with or without ozena.

Prognosis.—Prognosis should always be guarded, as the disorder runs a very variable course, and a plan of treatment that is successful in one case will be of no effect in the next. Some of the superficial forms of the disease are quite amenable to treatment, and in the more chronic patches, even if a cure cannot always be accomplished, decided amelioration may be secured. Relapses may be expected. The disseminated form is of grave import.

Treatment.—The **internal** treatment of the disease consists, for the most part, in the employment of remedies to improve the general health or for the correction of obvious complications. Some observers think they have seen good results from the direct action of certain drugs on the disorder itself. We quite agree with Leredde, however, in the statement that the large number of therapeutical agents recommended in lupus erythematosus is merely due to the fact, often observed in other dermatoses, that certain types tend to spontaneous recovery. J. C. White's skepticism as to the value of treatment in this affection is well known. So far as regards the internal administration of drugs in chronic forms of lupus erythematosus, we have seen no benefit from their employment, excepting, of course, remedies such as cod-liver oil, the hypophosphites, iron, etc., directed to the improvement of the general health or the removal of complications. We cannot say, either, that we have witnessed any appreciable benefit from

diet, although on general principles the patient should be directed to avoid stimulating foods and drinks.

In acute cases of the disease there is some reason to believe that certain remedies, given internally, have a beneficial action. Crocker's original suggestion of the value of salicin in such instances has apparently been borne out in our own experience. The drug should be given in doses of 15 gr. from the first. It is best administered in capsules or wafers.

Saline cathartics in appropriate doses may be ordered at the same time, preferably a suitable dose every morning before breakfast. Payne advises quinine in large doses under the same circumstances, and Unna gives ichthyol. None of these drugs is of any value in chronic infiltrated patches of the disease.

Hollaender's combined internal and local treatment by quinine and iodine may be mentioned here.

In the beginning, the patient's tolerance is tested in regard to quinine, and then the drug is pushed to about 7 gr., three times a day. Five or ten minutes after taking the dose, the diseased area is painted with tincture of iodine. This is continued for a week, and after a short pause again repeated. Morris and others have reported some good results from this method.

Arsenic (Hutchinson) iodide of starch (Anderson) and phosphorus have been prescribed with asserted advantage.

Bulkley¹ claims brilliant results from the last-mentioned agent given in solution as follows:

R—Phosphorus	gr. vj
Absolute alcohol	5xxx

To be dissolved with the aid of heat and agitation, and then mixed, while still warm, with the following mixture, also warm:

R—Glycerin	3ixss
Alcohol	3jss
Essence of peppermint	3ss

¹ American Journal of Medical Sciences, April, 1893.

The dose is 15 drops in water, taken quickly to prevent oxidation, three times a day after meals, and gradually increased to 45 or 50 drops. The value of the phosphorus treatment has been confirmed by other observers. Legrain employed injections of sheep serum successfully in a case, using two injections of 10 c.c. at intervals of five days.

The **local treatment** is, however, of far greater importance, and, according to the symptoms present in a given case, may be soothing, stimulating, or destructive. For the first purpose the calamine and zinc lotion, to each ounce of which may be added 10 minims of liq. carbonis detergens, is admirably adapted. Often, by such mild measures, patches may be made to disappear without subsequent scarring. In other cases of a more chronic character, but where the infiltration is moderate, various astringent applications may be tried. Duhring's lotion of sulphate of zinc and sulphide of potassium is very valuable:

R—Zinci sulphatis,	
Potassæ sulphuratæ	ss
Aquæ rosæ	℥ijss
Alcoholis	℥ij—M.

S.—Mop on morning and evening for ten or more minutes at a time.

Among other remedies of this class may be mentioned Lassar's paste modified as follows:

R—Zinci oxidi	℥ij
Pulv. talci	℥ij
Vaselini	℥iv

And Pick's linimentum exsiccans in this combination:

R—Liq. carbonis detergentis	℥x
Zinci oxidi	℥j
Linimenti exsiccantis	℥j—M.

Crocker recommends contractile collodion for its effect on the vessels. Unna employs ichthyol in combination with the collodion:

R—Ichthyolis	℥ss
Collodii	℥v—M.

H. Hebra suggested the frequent application of alcohol, or of equal parts of alcohol, spirit of mint, and ether.

In sluggish cases, especially of the sebaceous type, more stimulating remedies are demanded. The elder Hebra particularly recommended rubbing in the tincture of green soap (equal parts of green soap and alcohol) followed by an emollient salve. Oil of cade may be added to this preparation in the strength of 1 to 2 drachms to 1 oz. (Crocker). The green soap may be used alone for this purpose, or it may be spread as a plaster on flannel. The soap treatment is very valuable, as it not only removes the scales and sebaceous plugs, but distinctly reduces the infiltration. After a few days, when the irritation from the application has subsided, the treatment may be renewed. Crocker states that neither the soft soap nor the tincture of soap should be used where there is active congestion, or it will very likely aggravate the eruption. This warning holds good for all remedies of this class, for we have more than once seen a quiescent patch roused to activity by too energetic interference.

Crocker speaks in the highest terms of Hutchinson's treatment with benzolin. It should be used with moderate friction and followed by a mild antiseptic salve of iodoform (5 gr. to 1 oz.) or of boric acid. It should be applied at night, and calamine lotion mopped on during the day. If the benzolin sets up any irritation, the number of applications may be reduced to two or three a week.

Another remedy, that we have occasionally used with good results, is the often-quoted combination of salicylic acid and sulphur.

R—Acidi salicylici	5ss
Sulphuris præcip.	3j
Vasellini	3j—M.

S.—Rub in vigorously twice daily.

In old patches the application of the salicylic acid plaster mull helps matters very much, and we often apply it before commencing with the salve just mentioned.

In more indolent and resistant patches stronger remedies may be tentatively tried. Indeed the number of such agents is almost beyond reckoning, and indicates, as a matter of course, the rebelliousness and capriciousness of the disorder itself; but, nevertheless, Kaposi's remark is true enough, that no one remedy can be depended upon for all cases, or even for the same case at different periods of its progress. Stelwagon quotes with approval G. H. Fox's plan of painting over the plaques with pure liquid carbolic acid. Two or three patches only should be treated at the same time, and the application may be repeated after the crust has separated, that is, in about a week or ten days. Hyde and Montgomery advise the topical application of a saturated solution of pyoktanin blue. The solution is thickly painted over the entire portion affected, and the application may be repeated for a long period. Enzymol is also recommended by the same authors.

Painting with liquor potassæ, pure or diluted according to circumstances, is well spoken of by both Crocker and Stelwagon. The latter recommends that after the liquor potassæ has dried on the skin, two or three coats of collodion should be painted over it, the process being repeated every two or three days.

Salicylic acid in collodion, from 15 to 30 gr. to 1 oz., painted over the eruption, and repeated from time to time, is sometimes very serviceable, but, as a rule, we prefer the salicylated soap plasters in from 5 to 20 per cent. strength, especially the formula containing camphor given under Eczema (p. 93).

Resorcin is another remedy of the same class, which may be used in from 2 to 10 per cent. strength. Stelwagon advises a 10 to 50 per cent. strength in alcoholic solution, if in collodion a 3 to 20 per cent. strength. Mracek prefers it in the form of Lassar's scaling paste:

R—Beta-naphtholi	3ijss
Sulphur præcip.	3x
Vaselini,	
Saponis viridis	aa 3vj-gr. xv—M

Pyrogallol is recommended by Veiel in 10 per cent. ointment, which should be kept on for three or four days or until a crust forms, and when this separates the surface should be dressed with iodoform or some similar powder. Pyrogallol is also used as a paint in combination with salicylic acid, namely, salicylic acid, 1 part; pyrogallol, 3 parts, and flexible collodion, 40 parts. It is employed in much greater strength by Brooke:

R—Acidi salicylici	3ij
Pyrogallol	3 ^{ss}
Collodii	3v—M.

Schutz recommends a weak solution of arsenic, 1 in 400 to 600, or Fowler's solution in one-fourth or one-sixth of its strength, for local use. This may be painted over the patches twice a day, but in about a week or even in less time, as we have found, the affected parts become irritated, in which event the applications should be intermitted and a simple, protective paste applied. The lotion and the paste may be then alternated for several weeks.

In cases having hard, horny scales Veiel prefers chloracetic acid. It is put on with a glass rod, and soon produces a white eschar, and into this is bored a pointed glass rod dipped into the acid. This has been a satisfactory method in our hands in selected cases.

G. H. Fox and Dade obtained excellent results by deep freezing with liquid air. It should be used with caution.

Many years ago, one of us¹ employed and recommended electrolysis in certain types of lupus erythematosus, and an extended experience has confirmed him in his good opinion of this method. It is very useful in small infiltrated patches, and if carefully done need not produce any great amount of scarring. Even in relatively recent cases presenting more or less superficial lesions, tattooing with the electrolytic needle will cause their disappearance without any noticeable destruction of the skin. In an extremely persistent telangiectatic case a brilliant result was obtained by electrolysis.

¹ Hardaway.

Various surgical procedures have been employed in the treatment of lupus erythematosus, such as linear scarification, curettage, and even excision. The method of linear scarifications is to be preferred to other methods and also to the use of strong caustics.

For this operation one may employ any of the knives made for this purpose, preferably Pick's modification of Veiel's, Squire's or Van Harlingen's. Parallel incisions are made that are about one-sixteenth of an inch apart, and these are crossed by another series, and even a third. The parts should be first frozen with rhigoline spray, and the hemorrhage that follows may be checked by pressure with absorbent cotton and the wound dressed with iodoform. It is well to operate on limited patches at a time, and it is usually necessary to repeat the operation several times. (See Scarification, Part II.)

Today, however, we think it may be said that so-called radical methods of treatment are being more and more abandoned, and where the milder methods of treatment have proved unavailing, recourse is had to phototherapy, the x-rays, or the high-frequency current.

The same difficulty obtains in judging the merits of these new procedures as with the older methods, and for similar reasons.

The results obtained by Finsen, Leredde and Pautrier, Morris and Dore, Gaston, Baudouin and Chatin, and Hyde, Ormsby and F. H. Montgomery, summed up by the last named in December, 1903, give totals of 94 cases, with 36 cured and 28 improved. Such statistics, however, are not very significant, in view of the wide variety of lamps employed. Sequeira failed in one-half of 14 patients. Gottheil had 3 apparent cures, but 1 case recurred within the year. The method is not advised in the aberrant types of the disease. Cases that we have treated with a modified lamp and the results that we have occasionally seen at the hands of others have not been encouraging. Hyde and Montgomery state that the lesions in which the vascular element predominates, or which are subacute in

type, do better with phototherapy than with the *x*-rays, and that cases with marked infiltration and decided involvement of the glands and follicles resist the light treatment and improve more rapidly under the *x*-rays.

The X-rays.—In few affections are published reports so antipodal. While the majority of observers have little praise for the method, a few have obtained cures which can only be described as startling. Thus, James Startin reports a case, long stubborn to other agents, cured in six sittings, and Wood, 1 of four years' duration cured in five ten-minute sittings. Most extraordinary of all, however, is Oudin's case. A woman, aged twenty-nine years, had a small patch on each cheek. She had been treated without success by Fournier, Anderson, and Crocker. High-frequency currents were of no avail. Oudin irradiated the lesions for three successive days—one-half minute the first day, one minute the second, and one minute and one-half the third. On the fourth day the lesions were much better, and by the fifth had almost disappeared. After an interruption, five or six more sittings were given of from one to one and one-half minutes each. The patient was seen forty-six days after the first sitting and was found completely cured. We must remember in this connection that Oudin works with a red-hot target and a soft tube brought within two inches of the skin.

Pusey has observed marked improvement from this agent, but never a complete cure. He uses mild exposures at intervals of two or three days. We have obtained one cure, and great amelioration in a few cases, while others have apparently been harmed.

Belot declares that in this most obstinate disease *x*-rays give no better results than other modes of treatment. It is at least certain that, having determined to employ irradiation, we should only do so with the greatest circumspection.

Sabouraud dismisses the subject of treatment with **high-frequency currents** with the curt statement that they have been tried without satisfactory results. This opinion is by

no means shared by his colleagues in France. Both Brocq and Leredde, and Pautrier, regard this method with especial favor. Jacquet reports 56 cases with 39 cures. Bisserié, 62 cases with 33 cures.

Stelwagon in this country speaks highly of the high-frequency current in some cases. So far as our experience extends we can endorse much that has been said in its favor. We have used a flat vacuum electrode held at a distance of one-fourth to one-half inch, and the sittings have been given twice a week, and in some cases daily. **Radium bromide** has been used with many times its bulk of barium chloride, the radio-activity of the mixture varying from 1000 to 5200 (Danlos). This is enclosed in a caoutchouc bag and fastened over the lesion for from twenty-four to forty-eight hours. Strassmann obtained a cure in 3 cases.

ADDITIONAL PRESCRIPTIONS.

R—Pyrogallol 3ss
 Acidi salicylici 3ij
 Collodii 3v—M.
 S.—External use. In chronic conditions. Jessner.

R—Tr. iodi,
 Chloral. hydratis,
 Acidi carbolici 3j—M.
 S.—External use. For infiltrated patches. Cutler.

R—Iodoformi gr. xl
 Ft. pil. No. xl.
 S.—1 to 3 pills three times a day. Besnier-Whitehouse.

R—Zinci oxidi 3j
 Magnes. carb. 3jss
 Bol. albæ 3jss
 Bol. rubræ 3j
 Amyli oryzæ 3v—M.
 S.—Powder. In acute cases. Unna.

R—Zinci oxidi,
 Amyli,
 Glycerini 3ij
 Liq. alum. acet.,
 Aquæ destillatæ 3vijss—M.
 S.—External application in acute types. Jessner.

R—Acidi salicylici	3ss
Acidi lactici	3ss
Resorcini	gr. xlv
Zinci oxidi	3ij
Vaselini	3xvij—M.
S.—External use.	Brocq.

THE SYPHILODERMATA.

Description.—Syphilis is a chronic, infectious disease that first makes its appearance, after a varying period of incubation, in the shape of the so-called initial lesion, or chancre, which in turn, after a second period of incubation, is followed by the constitutional manifestations of the disease. While every tissue and organ of the body may be involved, the dermatologist is mainly concerned with the disorder as it presents itself on the skin. Before entering upon a brief description of the various eruptions which may develop, it will be well to take a brief view of the syphilodermata as a whole, and to point out certain more or less characteristic features in their course and general characters wherein they resemble each other, and differ from the non-specific affections of the integument. Among the peculiarities of syphilitic eruptions most worthy of attention are the following:

Location and Configuration.—Syphilitic eruptions may occur anywhere on the body, but the various special varieties would seem to have a preference for certain fairly definite sites. For example, the early erythematous syphiloderm is usually to be found on the sides of the chest, abdomen, loins, the flexor surfaces of the arms, and inner sides of the thighs; papular lesions develop in the same localities, as well as upon the palms, soles, forehead, at the margin of the scalp, and on the neck; the pustular forms are observed in the same situations as the last-mentioned variety, but also on the legs and in the hairy parts of the face and scalp; the rupial and ecthymatous syphilides affect the face and extremities; the squamous lesions the

palms and soles. Moist papules seek the mucous outlets; tubercular lesions the forehead, the back of the neck and the shoulders, and the junction of the nose and cheek; and the gummatous infiltrations are to be noted about the joints.

The early cutaneous manifestations are symmetrically disposed, and bear the character of a more or less generalized eruption; but later, while the symmetrical arrangement is retained, a tendency to group and form circles and segments of circles is a notable and characteristic feature; and the tardiest varieties lose the symmetrical disposition, and occupy comparatively isolated and limited regions.

Polymorphism.—The presence of many different elementary lesions at one and the same time, that is, macules, papules, pustules, etc., while seen in some of the simple disorders, if taken in connection with other phenomena, is of considerable diagnostic value.

Course.—Syphilis is essentially a chronic disease, and the syphilodermata lack the inflammatory features of the non-specific eruptions. The different original forms also exhibit a tendency, by a process of evolution, to develop into other forms, *e. g.*, from a papule into a tubercle, and the latter may undergo a purulent degeneration.

Color.—Syphilitic eruptions are by no means always of the same shade of color, this feature varying much with the age of the lesions, their locality, etc., but they may be said as a general thing to possess a ham or copper color, especially in the large papular and tubercular varieties of lesion; and while other skin diseases may show this tint in some instances, this symptom must be given due weight in differential diagnosis. The pigmentation left after the subsidence of syphilitic eruptions is not peculiar to this disease, being seen in lichen planus and upon the lower extremities after eczema; but it possesses somewhat more significance when situated on the trunk or upper limbs.

Absence of Itching and Pain.—A broad general rule of great value in the diagnosis of specific eruptions is the one relating to the absence of subjective symptoms, namely,

itching and pain, and while this fact is by no means to be regarded as pathognomonic, there being some exceptions, it remains, nevertheless, one of our best differential points.

Other Peculiarities.—Among other peculiarities of syphilitic eruptions, attention may be called to the characters of the scales, crusts, ulcers, and scars. The scales are a dirty white or grayish, are quite scanty, and do not possess the glistening aspect and imbricated arrangement seen in psoriasis, for example. The crusts are dark brown or have a greenish tint, are usually thick and rough; in rupia they are heaped up after the manner of an oyster shell. The ulcers of syphilis may assume various shapes, but the kidney-shaped and horseshoe form is quite characteristic. Their borders are generally sharply cut. Syphilitic scars are round or oval, and, except in the neighborhood of joints, quite soft and pliant, and not traversed by bands and cords. In old scars the white, glistening centre, and the peripheral ring of pigmentation may be also mentioned.

Finally, in establishing a diagnosis, it must be repeated that no one single symptom taken by itself will suffice in all cases and at all times; on the contrary, the case must be studied as a whole, and the history and the concomitants, namely, the glandular enlargements, the mucous involvements, and such other local or general symptoms as may be present must be given due weight.

The following types of eruption will now be briefly considered:

1. Syphiloderma erythematosum.
2. Syphiloderma papulosum.
3. Syphiloderma pustulosum.
4. Syphiloderma tuberculosum.
5. Syphiloderma gummatosum.
6. Syphiloderma bullosum.

Syphiloderma Erythematosum. (Syn. **Macular Syphilide**, **Syphilitic Roseola**, **Erythematous Syphilide**, **Exanthematous Syphilide**, **Syphilis Cutanea Maculosa**.)—The erythematous syphiloderm, or syphilide, is usually the earliest cutaneous manifestation, appearing in six or eight weeks from the

development of the initial lesion. The favorite regions of attack are the sides of the chest, the lower part of the belly, the flanks, and the flexor surfaces of the limbs. The face, backs of the hands, and feet are generally spared. The macules are of about the size of a silver ten-cent piece, sometimes larger or smaller, of a red color, which later becomes violaceous and finally pigmented. At first they may be made to fade on pressure, but afterward they cannot be effaced. Usually the macules are not elevated above the level of the skin, but at times the eruption assumes a maculopapular character, and in the further evolution of the disease the lesions may become frankly papular and even pustular. Subjective symptoms, if present at all, are very slight.

Relapses of the erythematous syphiloderma sometimes occur, taking place during the first year. They are apt to be localized, and the lesions show a tendency to assume the circinate form.

What is known as the **pigmentary syphilide** is a comparatively rare expression of the disease. It appears early or late in the course of the affection, is more frequent in females, and is usually seated upon the lateral surfaces of the neck. At first sight the affected parts look as if they were dirty, but a closer inspection will discover irregularly round or oval spots of a light chocolate color that are not very sharply defined.

Syphiloderma Papulosum. (Syn. **Papular Syphilide, Syphilis Cutanea Papulosa.**)—The **small papular, or military papular syphiloderma** varies in size from a pin's head to a linseed, is rounded or acuminate, of a bright-red color in the beginning, but gradually takes on a darker hue. The eruption may be scattered or grouped, sometimes arranged in patches, and is most freely developed on the trunk. Some of the papules are capped by minute vesicles or vesicopustules. The eruption makes its appearance in two or three months from the development of the chancre, is very chronic, and prone to relapse. When the papules undergo involution they leave behind pigmentation and shallow, atrophic pits.

This form of eruption should not be confounded with papular eczema, keratosis pilaris, or lichen planus (*q. v.*).

The **large papular syphiloderm** (lenticular syphilide) is a common and characteristic type of syphilitic eruption. The lesions vary in size from a split pea to a small coin, are flat or hemispherical, thoroughly defined, smooth, glistening, and, in the later stages, of a decided ham color. They come out quite freely, and in the beginning may be widely disseminated, appearing on the trunk, face, forehead (*corona veneris*), scrotum, labia, anus, etc. This syphiloderm may appear early or late in the disease and is apt to relapse. The papules, after persisting for a variable period, disappear by absorption, followed by pigmented, atrophic spots that gradually turn white.

Occasionally, and especially in negroes (Atkinson), in connection with this eruption there develops on the neck or in the region of the mouth or forehead the **annular syphiloderm**, which consists of a flattened centre surrounded by an elevated, non-scaly or slightly scaly wall. Several such lesions, discretely arranged, may be present, or the eruption may be in the shape of interlacing segments.

Important modifications of the papular syphiloderm are the moist papule and the papulosquamous form of eruption.

Moist Papule. (Syn. **Mucous Patch, Broad or Flat Condyloma.**)—This lesion varies in size from a pin's head to a small coin, the large condylomata being formed by the coalescence of those of smaller diameter. A common situation for the moist papule is in regions that are more or less in contact, heat and moisture favoring their development. Thus they are found about the anal and genital regions (in women), under the breasts, between the toes, in the axillæ, etc. They are of a rather soft consistence, and the surface is usually bathed in a sticky, mucoid secretion that is highly contagious and often very offensive. The surface is generally flat, and the lesion possesses a well-defined outline; on the other hand, papillary hypertrophy may develop, resulting in elevated, warty growths,

pouring out stinking fluid from between the papillæ, which dries into yellowish-brown crusts.

The term **mucoous patch** or opaline patch is generally limited to the eruption as it occurs in the oral cavity and on the lips. As a general thing the lesions are but little elevated, flat and sometimes slightly depressed, grayish in color, and at times very painful.

Papulosquamous Syphiloderm. (Syn. **Squamous Syphilitide**, **Psoriasis Syphilitica**, **Syphilis Cutanea Squamosa**.)—At times the amount of scaling is so marked a feature of the papular eruption as to warrant the designation of the scaly syphiloderm, or, as it is sometimes unscientifically termed, syphilitic psoriasis. The eruption is generally localized, and the scales, which are of a dirty, grayish color, are not so detachable nor profuse as in psoriasis. The lesions may be discrete or form groups, and by fusion develop into patches of considerable size, and in the further march of the disease, that is, by simultaneous evolution and involution, various ringed and gyrate figures may be formed, quite as in psoriasis vulgaris. Papillary hypertrophy may also take place in addition, with the result of producing warty, vegetating lesions (**syphilis cutanea vegetans**).

While the squamous syphiloderm may be found upon any portion of the body, the palms and soles are particularly liable to attack.

Palmar and Plantar Syphiloderm.—This syphiloderm is very chronic, and may be a recent or late manifestation. Syphilitic papules in this region are considerably modified by the thickness of the epidermis and the traumatism to which they are necessarily subjected. The various specific lesions that appear upon the palms do not all go, however, to form the true scaling syphiloderm of this region, although under certain favoring circumstances this transformation generally occurs. There may be one large patch or several small ones. Scaling follows, and even fissures and ulcers. Exceptionally, the disease creeps along with a crescentic margin somewhat elevated, and of a line or more in width. This syphiloderm must be distinguished from psoriasis

and eczema. Psoriasis limited to the palms is rare, there generally existing lesions of the disease in the usual situations; squamous eczema usually presents more infiltration, is more widely spread, and is attended by more itching.

Pustular Syphiloderm. (Syn. **Syphilis Cutanea Pustulosa**, **Pustular Syphilide**.)—This syphiloderm is not so frequent as the varieties just described. It may be an early or late manifestation, originates from macules or papules, and undergoes various modifications, and, according to circumstances, is termed acne-form, variola-form, ecthyma-form, etc. In the interest of clinical simplicity it will be treated under the following heads:

The **small, acuminated, pustular syphiloderm** is generally seated upon papular bases, about the size of millet seed, that have their origin about the hair follicles. The lesions may be grouped or disseminated, may involve the whole surface or be localized, the latter mode of development occurring especially in relapses. The purulent contents dry into crusts, which falling off display a collarette of epidermis around the base of the lesions. This variety of pustule may appear early or late, and is apt to relapse. It is not unusual to discover other syphilitic lesions at the same time.

The **large, acuminated, pustular syphiloderm**, also called the acne-form and variola-form syphiloderm, is formed about a hair follicle or sebaceous gland, and consists of pustules of the size of a split pea, seated upon a dark-red base. While occurring upon the body generally, they select by preference the scalp, shoulders, and face. The pus dries into rather thick crusts of yellowish-brown color, and are sometimes umbilicated, that is, depressed in the centre, and underlying this is some degree of ulceration. It is an early manifestation, and somewhat rare.

This syphiloderm should not be confused with smallpox in the pustular stage—to which the lesional resemblance is very close, with acne, or with iodic or bromic acne.

The **small, flat, pustular syphiloderm**, or impetigo-form syphilide, develops in the form of small, flat pustules, seated

upon reddish bases, the pus drying into thick, yellowish, or yellowish-brown crusts. The lesions may be isolated, grouped, or else run together into large pustulocrustaceous patches. The surface beneath may be superficially or deeply ulcerated; in the latter event the eruption is either a late symptom, or has developed in a broken-down subject.

This syphiloderm is especially encountered on the scalp, genitals, face, and limbs. On the scalp it resembles pustular eczema, but in the latter affection, in addition to the pruritus, there is absence of ulceration beneath the crusts, and of the repulsive odor usually present in syphilis.

The **large, flat, pustular syphiloderm** occurs late, and manifests itself in the form of isolated, unsymmetrical, large, flat lesions having a deep-red base. Crusting, the character of which will depend upon the nature of the lesion, soon follows the appearance of the eruption, and in every instance will be found covering underlying ulcers. Two varieties are described, the superficial and the deep, the difference consisting, among other things, in the quality of the infiltration and the character of the subsequent ulceration. The crust in the superficial or ethymatous form is flat, although relatively thick, of uneven shape, and of brownish or blackish color. The underlying erosion is not very deep, and secretes a yellowish fluid; sometimes the line of ulceration extends as a furrow beyond the crust. This syphiloderm usually attacks the trunk and extremities, and occurs within the first year after infection.

The crusts of the deep form are conical, stratified as in the oyster shell, and are of a black or greenish-black color, and quite bulky. Underneath, the ulceration is profound, and the floor of the lesion secretes a yellowish, puriform fluid upon which the superimposed crusts may be said to swim. This condition is called **rupia**, and, so far as we know, has no analogue among the non-specific eruptions. It must be stated, however, that this character of crust is not strictly limited to the lesion in question, but is also found in the so-called bullous and even in the tubercular syphilo-

derm. The deep pustular syphiloderm is a late manifestation, and is associated with general cachexia.

Syphiloderma Tuberculosisum. (Syn. **Tubercular Syphilide, Syphilis Cutanea Tuberculosis.**)—The tubercular syphiloderm is a late manifestation, sometimes occurring years after infection, and often in such cases, especially in women, it is impossible to get a history of any intervening lesions. It is one of the most frequent of the syphilodermata. As ordinarily encountered, the tubercles appear in limited numbers, occur in groups, and occupy certain localized regions. The lesions are of brownish-red color, of semi-globular shape, circular outline, and of firm consistence. In size they vary from a pea to a bean or even a hazelnut, and correspond in many respects to the large papules already described.

The tubercular syphiloderm is particularly apt to attack the face, the back, and the neighborhood of the joints. When an early precocious manifestation, the whole body may be involved, but the more remote the infection the more apt is the eruption to consist of a few or a single group of tubercles. These groups may present different configurations; for example, according to the stage of evolution, there may be present clusters of tubercles with crescentic edges, or a ring may be formed by the method of development of the lesions, or the eruption will assume a serpiginous character, as a result of central absorption, or by coalescence of several groups.

The tubercular syphiloderm runs a chronic course, and, untreated, may persist for an indefinite period. It may terminate either by resolution or ulceration. In the former event the skin is left depressed, pigmented, and sometimes somewhat scaly, but atrophic changes may often be prevented by timely treatment. When ulceration occurs it is rarely general, but here and there a tubercle breaks down and exhibits a small, rounded, punched-out ulcer, usually situated in the periphery of the patch, and covered by crusts. By the breaking down of all the tubercles in a patch the individual ulcers may unite to form one large

ulceration. This syphiloderm may also undergo the papillomatous transformation, producing the so-called **fram-besia syphilitica**, or **syphilis cutanea papillomatosa**.

The tubercular syphiloderm is to be distinguished from lupus vulgaris, leprosy, and epithelioma. (See those diseases.)

Syphiloderma Gummatosum. (Syn. **Gummatous Syphilide**, **Syphilis Cutanea Gummatosa**.)—Gummata occur late in syphilis and are most commonly situated upon the scalp, forehead, buttocks, about the joints, and where the connective tissue is loose and abundant. Only one or two tumors are usually to be noted; exceptionally the growths may be numerous. The growth makes its appearance in the tissues as a small pea-sized, firm, circumscribed nodule, which gradually increases in size, attaining the diameter of a walnut or forming even larger deposits. The overlying skin, at first normal in color, finally becomes encroached upon and assumes a reddish hue, and the gumma will feel soft and doughy to the touch. Gummata may disappear by absorption, or else ulceration occurs and leaves in its wake a deep, clean-cut ulcer that secretes a bloody, fetid pus. Healing is often slow and may be further delayed by various accidents, such as gangrene, phagedena, etc. Ulceration may also extend deeply and involve the bones in a necrotic process, and in the end produce great deformity. This syphiloderm should be differentiated from fatty and fibrous tumors, from erythema nodosum, abscesses, and furuncles. Sometimes the gummatous infiltration, instead of being circumscribed, appears as a large, palm-sized area which is not sharply defined at the borders.

Syphiloderma Bullosum. (Syn. **Bullous Syphilide**, **Syphilis Cutanea Bullosa**.)—The bullous syphilide, if it be properly distinguished from certain forms of pustular lesions, may be regarded as a rare symptom in adults, and it is said to occur for the most part in cachectic subjects. On the other hand, as is well known, it is not uncommon in hereditarily affected children. The bullæ vary much in size, have clear contents in the beginning that gradually become purulent,

and the effused pus dries into thick, greenish-black, adherent crusts, sometimes taking on the rupial arrangement, in which case the underlying ulceration is profound.

Bacteriology.—Schaudinn and Hoffman, in May of 1905, announced the discovery of the *Spirochæta pallida* as the exciting agent of syphilis. Its presence has been established by many other observers in the fluids expressed from primary and secondary lesions in the tissues and in the blood of syphilitics, and in hereditary cases. Metchnikoff and Roux found it in their successful inoculations in oranges and chimpanzees.

Prognosis.—The prognosis of the syphilodermata necessarily involves the future of the disease as a whole. The various phases of this question cannot be discussed here; but it may be said that the disease is not the hopelessly incurable malady that it is popularly supposed to be—on the contrary, under modern methods of treatment, hygienic and specific, the outlook is far from gloomy, and while from many causes a considerable number of syphilitics go from bad to worse, a still larger proportion apparently recover.

Treatment.—The treatment of the syphilodermata is mainly constitutional, being directed to the systemic condition upon which the cutaneous expression of the disease depends, but at the same time well-directed local measures are often of great value in expediting a cure. Mercury and the iodides are specific remedies in syphilis, and, employed in a judicious manner, are absolutely indispensable; but here, as elsewhere, the general state of the patient, as well as the name of his disease, must be taken into consideration to obtain the most satisfactory results.

Before beginning the constitutional treatment, the patient should receive definite instruction in matters of personal hygiene, such, for example, as the care of the skin in the way of bathing, and the frequent use of the tooth-brush and of some appropriate mouth-wash; it is also generally advisable to have the teeth put in good condition by the dentist. In our judgment tobacco in any form should be

prohibited absolutely, and we are sure that the patient is much better off without alcohol.

A patient should never be put on specific treatment until the diagnosis of syphilis is absolutely established, and we believe we can never be quite certain of that fact, until the period of the general manifestations of the disease. Violation of this cardinal rule leads to an infinite amount of mischief.

The only trustworthy way of treating syphilis is with **mercury** and the **iodine** preparations.

There are a number of different methods of introducing mercury into the system, namely, by the mouth, by inunction, by fumigation, and by hypodermic injection; and each undoubtedly has its place in selected cases. The most convenient and practicable avenue is by the mouth, and although at times attended by certain drawbacks, ordinary skill and care will readily obviate these inconveniences. Among the preparations commonly employed may be mentioned the protiodide, the gray powder, blue mass, corrosive sublimate, and the tannate.

In this country, the protiodide is the favorite salt with most physicians. It may be given in pill form, combined or not with conium or opium, or as a tablet triturate. The sugar or gelatin-coated pills are also suitable. Usually, from $\frac{1}{4}$ to $\frac{1}{2}$ gr. of the protiodide will suffice, but if a more decided impression is demanded this quantity may be increased to 2 or even 3 gr. a day, but generally under such circumstances some other preparation or mode of administration may be selected with advantage. The golden rule is, we think, to give only such amounts of the drug as will do the work in hand with the least detriment to the patient. In nearly all cases of early syphilis, iron, or iron and quinine should be combined with the mercury.

A most excellent formula suggested by Dr. R. W. Taylor is as follows:

R—Hydrarg. protiodidi	gr. vj-vij
Ferri et quiniæ citratis	ʒjss
Ext. hyoscyami	gr. vj—M.
Div. in pil. xxx.	
S.—One pill three times a day.	

Sometimes it is more convenient to give the tonic separately from the mercury, so that the amount of the latter may be increased or diminished as required. So soon as the patient's general health improves, although very often it is not visibly affected, the tonic may be dropped and the mercury given alone.

Should the mercury produce any griping or diarrhea, some carminative or a little paregoric may be given from time to time. Except in the most urgent cases it is not desirable or necessary to produce the toxic effects of the drug, but in all cases the condition of the mouth should be constantly noted and as soon as there is any tenderness of the gums or other evidences of salivation, the remedy should be given in diminished doses or discontinued for a brief period.

It is a habit with some physicians to change the preparation of mercury from time to time, either from a belief that certain combinations are useful for certain periods in the disease, or that in this way better results may be obtained. We are, however, in the habit of giving some one suitable salt throughout; such as the protiodide, for example, and if a change is required, to make it in the direction of inunction or hypodermic injection.

The **inunction** method is a most valuable way of giving mercury, and while it may be used exclusively, we believe it is better to employ it in alternation with mercury by the mouth. The preparation usually recommended is the freshly prepared unguentum hydrargyri, 50 per cent. strength, put up in capsules or oiled papers containing from 50 to 60 gr. White and Martin prefer the following prescription:

R—Ung. hydrargyri,
 Ung. petrolii carbolat. aa 3j
 M. et div. in part., No. xvi.
 S.—Use one portion at bedtime.

Before beginning the rubbings, the patient should take a hot bath followed by brisk **towel**ing, or, if this is impracticable, the part to be anointed should be well washed with

soap and water, after which it may be mopped with a 2 or 3 per cent. carbolic solution (Taylor).

The ointment should be well worked in with the palms, and from twenty to thirty minutes should be occupied in this process. Since the skin would soon react to long-continued applications in one place, different portions of the body must be selected for the successive inunctions, taking care to avoid hairy regions. The parts of the body suitable for this purpose are the inner surfaces of the thighs, the sides of the thorax, the inner surfaces of the arms, the flanks, the lower part of the leg, etc.

As a rule, the same underclothing should be worn for several days while undergoing the treatment, but if this be objected to, a bath may be taken in the morning, clean linen used in the day and the old garments slept in at night.

On the evening of the sixth day, under any circumstances, the patient should suspend the inunctions, take a hot bath, and begin again on the seventh day. As a rule, we believe it is well to stop the rubbings for a few days after a three weeks' course, but the total length of the inunction cure will depend upon the condition of the patient's general health and the influence of the treatment on the specific lesions.

Among the advantages of this inunction method may be mentioned, first, its distinct therapeutic value, secondly, the absence of gastric disturbance, and, thirdly, that simultaneously other treatment, tonic or specific, such as the iodides, may be given by the stomach.

Among the disadvantages may be mentioned the extreme unpleasantness of the method, the difficulty of getting the inunctions properly done, the great liability to stomatitis, and the possibility of setting up a mercurial dermatitis which may become generalized; this latter complication is, however, very unusual.

The **hypodermic injection** of mercury is indicated when a speedy effect is urgently demanded, or where other methods of administration are contra-indicated or fail of effect.

As an exclusive method of treatment hypodermic injec-

tions have not met with much favor in this country, in spite of the approval of such excellent authorities as Klotz and others.

The **technique** of the operation is very important.

The syringe should be of hard rubber, or, preferably, of glass, having a tough needle sufficiently long to allow the medicament to be deposited in the subcutaneous tissue, or into the muscle, according to the preference of the physician. All preparations for injection should be taken with a view to complete asepsis.

The hands of the physician having been cleansed after the approved surgical manner, the site for injection should be wiped off with alcohol, or otherwise rendered sterile. The best locality for hypodermic injection is the depression just posterior to the great trochanter, and next, the subscapular region near the spine. The suspensions of insoluble salts should be thrown into the gluteal muscles, entering the needle at a point between the ischial tuberosity and the trochanter, and pushing, perpendicularly, into the muscle. Having expelled all air from the syringe, the needle is plunged into the tissue. If an insoluble salt is used, the barrel should be removed in order to see if a vein has been entered, in which case blood will issue from the open end of the needle. By this procedure, the chance of embolism may be averted.

The barrel is then replaced and the injection made. The puncture should be sealed with collodion.

Care should be taken at all times to introduce the needle deeply enough, whether it be into the subcutaneous cellular tissue or into the muscle. Gentle massage hastens the disappearance of the resulting tumefaction and lessens the danger of a painful nodosity. A great number of preparations of mercury have been recommended for subcutaneous injections, of which only a few will be mentioned here.

Soluble Mercurial Salts.—So far as the soluble salts are concerned, corrosive sublimate will meet all the requirements with the least danger to the patient. It is best to

have the solution freshly made with distilled water, and the prescription so calculated that 20 or 40 minims will contain $\frac{1}{8}$ gr. This is the usual initial dose, although it may be increased to $\frac{1}{4}$ or $\frac{1}{2}$ gr. Taylor regards $\frac{1}{4}$ gr. as the proper dose. The injections may be made daily, or on alternate days, but both the frequency of the injections and the amount of mercury administered will depend upon the case in hand.

Insoluble Salts.—The insoluble salts most generally employed are calomel, metallic mercury given in the form of gray oil, salicylate of mercury, and the yellow oxide. The insoluble salts are, as a rule, injected once a week. (See list of formulæ below.)

The question of the value of subcutaneous injections of mercury in the treatment of syphilis has been so thoroughly threshed over that it would be a waste of time to consider it now.¹ Intramuscular injections are rarely required in the treatment of the skin lesions of syphilis, but constitute a precious resource in dealing with threatening brain and cord lesions. With an improved technique, and a better understanding of the proper dosage, the method is free from the many accidents that were so common in earlier years.

There are various **other methods of introducing mercury** into the system, which have been advocated from time to time, but which, while accomplishing this object to a greater or less degree, can in no way take the place of the more usual measures and should not be relied upon in the routine treatment of syphilis. Briefly stated, these methods are, by intravenous injection, by fumigation,² which con-

¹ This question is exhaustively discussed in Fournier's *Treatment of Syphilis* now translated (Rebman Company, New York), and in White and Martin's *Genito-urinary and Venereal Diseases* (Lippincott, Philadelphia).

² Fumigation, while not to be depended upon exclusively in the routine treatment of syphilis, is of undoubted value in chronic scaling and ulcerative lesions. The mercurial vapor is generated from a Lee lamp on which has been placed 20 gr. of calomel and 40 of cinnabar (Taylor). The clothes are entirely removed and the patient is seated over the apparatus, covered with blankets up to the neck. Each bath lasts from ten to twenty minutes. Baths may be taken every other day, and later, if required, daily.

sists in the vaporization of calomel, the administration of mercurial baths, the application of mercurial plasters, and the wearing of mercurial flannels (mercolint).

The **iodine compounds** are used by some physicians in the early stages of syphilis, and there is no doubt that they give much relief to the arthritic pains and neuralgias of that period, but, as a rule, this method of medication should be reserved for the second year, and then administered in conjunction with mercury. However, there are, necessarily, exceptions to this rule, as in the case of precocious syphilis, etc. Of the enormous value of the iodides, and preëminently of the iodide of potassium, in late and tertiary lesions, there is no doubt that even here mercury should be prescribed at the same time and kept up for a season after the discontinuance of the iodide.

Owing to the intolerance many persons show for the iodide of potassium, other iodine salts have been recommended at various times, but with the exception of the iodide of sodium, which should be given in somewhat larger doses than the iodide of potassium, these substitutes are not to be relied upon.¹

The usual dose of the iodide of potassium is from 5 to 20 gr., three times a day, but this quantity may be greatly exceeded.²

Our own experience inclines us to relatively small doses, and we are firmly of the opinion that if the drug is given with tonics and stomachics the curative effect will be much

¹ Leistikow states that inunctions of iodinvasogen (6 to 10 per cent.) may be depended upon when this drug cannot be taken by the mouth. Forty-five grains may be rubbed in daily for three weeks, giving one inunction daily. Iodipin by the mouth or subcutaneously is also recommended. (See formulæ.)

² Fournier insists that small doses of iodide appear to be particularly harmful, that is, that they are more frequently followed by severe signs of intoxication. As an initial dose he gives an adult man 30 gr. a day, and a woman 15 to 20 gr. Subsequently this daily dose is raised to 45 gr. and then to 60 gr. or more if necessary. On the other hand, he is opposed to the colossal doses (100 gr. or more) that are sometimes administered, basing his opposition on the fact of their uselessness.

more prompt than with large quantities of the iodide administered alone. (See formula below.)

The best time to give the iodide is directly after meals, and well diluted. If for any reason it is not desired to combine it with other drugs, it may be administered in syrup of sarsaparilla, plain water, milk, Vichy, essence of pepsin, or junket.

The so-called **mixed treatment** consists in the simultaneous administration of mercury and iodide of potassium, and is held to be of especial value in tardy manifestations of the disease. A formula that we have employed for many years, and which we owe to the elder Bulkley, is as follows:

R—Hydrargyri protiodidi, gr. v-x
 Ext. opii gr. v
 M. et div. in pil. No. xx.
 S.—One pill morning and evening.

R—Potassii iodidi ℥ss
 Ferri et ammonii citratis ℥j
 Tr. nucis vomicæ ℥ij
 Aquæ ℥jss
 Tr. cinchonæ comp. q. s. ad ℥iv—M.

S.—Teaspoonful in one-half glass of water after meals.

It is absolutely necessary that the tincture of cinchona should be detannated.

It is often a good plan to give the patient in addition a saturated solution of iodide of potassium (R—Potassii iodidi, ℥j; aquæ destillatæ, q. s. ad f℥j—M.), so that larger doses of the salt may be administered from time to time as may be indicated.

The two drugs may be combined in the same prescription:

R—Hydrargyri biniodidi gr. ss-j
 Potassii iodidi ℥ij
 Ammonii iodidi ℥ss
 Syr. aurantii corticis ℥ij
 Tr. aurantii corticis ℥j
 Aquæ destillatæ q. s. ad ℥iv—M.

S.—Teaspoonful well diluted in water after meals. Keyes.

R—Hydrargyri bichloridi gr. ij-iv
 Potassii iodidi ℥viiij
 Syrupi sarsaparillæ comp. ℥viiij—M.

S.—Teaspoonful in water after meals.

Another formula of great value is given by Hayden:

R—Hydrargyri biniodidi	gr. j-ij-iii
Potassii iodidi	3ij-3iv
Ess. pepsiini	3ij
Aquæ	q. s. ad 3iv—M.

S.—Teaspoonful in one-quarter glass of water after meals.

The bichloride of mercury, combined with the iodide of potassium, and prescribed in conjunction with a bitter tincture, or, in anemic subjects, with the tincture of the chloride of iron, is a favorite prescription with many syphilographers.

The question of the **length of time** constitutional treatment should be kept up is of much practical importance. So far as the administration of mercury is concerned we must confess to little confidence in the long-continued, uninterrupted courses running over years. In our judgment some form of the so-called interrupted treatment is to be preferred after the first six or twelve months.

In a fresh case of syphilis a more decided impression can be made on the disease in the first year than at any other time, therefore the physician should take advantage of his opportunity, and, the patient's condition allowing it, push the treatment with steadiness and vigor. With brief intervals of rest, it is advisable to keep up the mercury for at least six months, and oftenest a year; at the end of this time omit treatment for a month or six weeks, giving tonics in the interval. At the expiration of the allotted period order a course of inunction or put the patient again on the protiodide or other suitable mercurial. Henceforth, that is for the next year and one-half, the periods of active treatment are gradually decreased in length and the periods of rest increased.

Usually in the beginning of the second year the iodide of potassium is added to the mercury, constituting the mixed treatment. Of course, it will be understood that the dose and method of mercurial treatment, the time for the addition of the iodides, the length of time occupied in active medication, or in abstention from medication, will depend largely upon the case in hand.

Finally, we believe that even in the absence of all symptoms of the disease the patient should follow up the period of active treatment, with at least two courses of specific medication during the year, for three or four years longer.

Experience has forced the conviction upon us that treatment, and **much** treatment, offers the best guarantee for the patient's future welfare.

In this place it is opportune to call attention to the fact that in daily practice we often meet with apparently intractable cases of late syphilis, which persist or repeatedly relapse in spite of the most heroic specific treatment. In such cases absolute omission of all antisyphilitic medication for a season, or the combination with specific drugs of appropriate tonics and stomachics, especially iron and nux vomica, will soon bring about satisfactory results. In other words, it is altogether too common a habit to give mercury and the iodides in a routine way in syphilis, and to ignore the patient who happens to have the disease.

ADDITIONAL PRESCRIPTIONS.

R ₃ —Hydrarg. tannici	gr. xv-xxx
Quininæ sulphatis	ʒj
Ext. hyoscyami	gr. vj

Div. in pil. No. xxx.

S.—One pill three times a day. Hayden.

R ₃ —Hydrarg. cum creta	gr. xxxvj
Quininæ sulph.	gr. liv
Pulv. opii	gr. vj
Ext. quassia	q. s.—M.

Ft. pil. No. xxxvi.

S.—One pill after meals three times a day. Whitla.

R ₃ —Hydrarg. chlor. corrosiv.	gr. j-ij
Potassii iodidi	ʒij-iv
Ferri et ammon. cit.	ʒj
Tr. nucis vomica	ʒij
Tr. cinchonæ comp.	ʒss-ʒij
Aquæ	q. s. ad ʒiv-M.

S.—Teaspoonful in water after meals Bulkley.

R—Mass. hydrarg. gr. xl
 Ferri sulphatis exsiccata. ℥j
 Ext. opii gr. v—M.

Div. in pil. No. xx.

S.—One pill twice to four times a day. Bumstead.

R—Hydrarg. chlor. corrosiv. gr. j-ij
 Tr. ferri chloridi,
 Acidi hydrochlorici diluti aa ℥ij-iv
 Syr. aurantii flor. ℥ij
 Aquæ q. s. ad ℥viii—M.

S.—Teaspoonful in wineglassful of water after each meal.

Hyde and Montgomery.

R—Fl. ext. erythroxylon cocæ ℥ij
 Tr. gentian. comp.,
 Tr. cinchon. comp. aa ℥j
 Elix. calisayæ ℥iv—M.

S.—One tablespoonful in wineglassful of water, three times a day,
 one hour after meals. As an adjuvant in the treatment of syphilis.

Taylor.

R—Strychninæ sulph. gr. ss
 Calcis glycerophosphat ℥iij
 Aquæ q. s. ad ℥iv—M.

S.—Shake. Teaspoonful before meals in water. As a tonic.

Greene.

R—Hydrarg. chlor. corrosivi gr. iv $\frac{1}{2}$
 Sodii chlor. gr. iijss
 Aquæ destillatæ ℥j—M.

S.—One per cent. solution of mercuric chloride. 10 to 30 minims
 hypodermically. White and Martin.

R—Hydrarg. oxidi flav. gr. xv
 Acaciæ gr. iv
 Aquæ destillatæ ℥j—M.

S.—Fifteen minims at an injection.

R—Calomelanos gr. xxiv
 Glycerini puri ℥ij
 Aquæ destillatæ ℥ij—M.

S.—Dose: From 5 to 15 minims to be repeated at intervals of
 from five to fifteen days. This can be sterilized by placing the lightly
 corked bottle in water up to the neck, raising the temperature up to
 the boiling point and keeping it there for an hour. Gottheil.

R—Mercury (by weight) ℥j
 Anhydrous lanolin (by weight) ℥iv
 Liq. paraffin, carbolized to 2% (by vol.) to ℥x
 S.—Fifteen minims is a full dose. Lambkin.

R—Hydrarg. salicylici gr. lxxv
 Olei paraffini ℥j—℥v½—M.
 S.—Inject 15 minims. Ravold.

R—Xeroformi gr. xxiv—xlviij
 Vaselinei ℥ij
 Lanolini ℥vj—M.
 S.—Spread on patent lint. For syphilitic ulcerations.

R—Hydrargyri ℥ij
 Olei terebinthinæ ℥xx
 Cere flavæ gr. xx
 Resinæ gr. xl
 Styracis ℥j
 Empl. plumbi ℥j—M.

S.—Emplastrum de Vigo, used by the French for the same purpose as the mercurial plaster of Neumann.

R—Hydrarg. ammoniati. gr. xx—xxx
 Zinci oxidi ℥ss
 Pulv. amyli ℥ij
 Vaselinei ℥j—M.
 S.—For papular and pustular eruptions.

R—Hydrargyri ℥iv
 Olei terebinthinæ ℥ij
 Cere flavæ ℥iij
 Empl. plumbi ℥jss—M.

S.—Spread on cotton cloth. To resolve nodules of syphilis and to stimulate ulcerations. Neumann.

R—Resorcini gr. xxx
 Adipis benz. ℥j—M.

S.—Local use. For the erythema of syphilis associated with seborrhea. Greene.

R—Olei rosæ geranii gtt. viij
 Quininæ bisulph. gr. xx
 Tr. cantharidis ℥v
 Tr. jaborandi. ℥j
 Aquæ picis q. s. ad ℥viiij—M.

S.—Rub into scalp in syphilitic alopecia. Greene.

Judicious **local treatment** will often hasten the disappearance of disfiguring or annoying cutaneous lesions. Certain of the earlier and more superficial manifestations require nothing, but papular lesions on the face are much helped by ointments of the white precipitate, consisting of 30 to 60 gr. of the medicament to 1 oz. of lard or cold cream. Oleate of mercury in from 5 to 20 per cent. strength is also useful on covered surfaces. We often use Unna's formula of 1 drachm of ichthyol, $\frac{1}{2}$ oz. of ung. hydrarg., and 3 drachms of lanolin. Squamous patches on the palms and soles are much helped by the compound salicylated soap plaster. The x-rays are also valuable in these cases. Moist papules are best treated by absolute cleanliness, and contiguous skin surfaces should be kept apart by interposition of absorbent cotton. The lesions may be dusted with dry calomel, or, if obstinate, occasionally touched with the nitrate of silver stick, or the acid nitrate of mercury.

In ulcerated lesions generally, the crusts are to be removed and the ulcers dressed with aristol or some other similar powder. Syphilitic tubercles usually disappear promptly under internal treatment, but it is sometimes advisable to apply local remedies simultaneously. The salicylated soap plaster, spread on cloth, is excellent for this purpose, as is also the emplastrum hydrargyri of the German pharmacopeia. Mercurial vapor baths and baths of corrosive sublimate are also excellent means for the removal of local lesions.

Cutaneous Eruptions of Hereditary Syphilis.—The lesions of the skin due to inherited syphilis present peculiarities sufficiently marked to warrant separate consideration. On this organ the first observable symptoms of the disease are apt to fall.

Although syphilitic children may present specific eruptions at birth, or, indeed, during intra-uterine life, it is a matter of common experience that they often appear comparatively healthy when first born. This condition of apparent well-being rarely continues beyond the first six

weeks, and even before any disturbances of the skin are observed the child will often present marked evidences of syphilitic cachexia.

Among the more prominent general symptoms are to be noted the characteristic snuffling, the sallow skin, and the striking senile appearance of infants thus affected. The principal eruptions seen in connection with hereditary syphilis are the following:¹

The **erythematous syphiloderm**, or syphilide, is the commonest and usually the earliest hereditary eruption, sometimes being present at birth, but rarely developing after the third month. The rash generally first appears upon the belly and lower part of the chest, and spreads from those situations to other portions of the body, limbs, and face. The lesions, which are about the size of the finger-nail, and of an ovalish contour, are of a somewhat bright red in the beginning, and may be effaced by pressure, but later on they assume a coppery color. The macules often coalesce to form extensive non-elevated patches. When the erythema occurs in large sheets a common situation for its development is about the neck and buttocks. In these latter localities it simulates ordinary intertrigo very closely, except that about the anal and genital regions it travels beyond the parts covered by the diaper, and runs down the backs of the legs to the heels. A few outlying macules or maculopapules may generally be discovered. It is not uncommon to find the palms and soles red, wrinkled, and desquamating. The bistre tint so often seen in the face is due to the pigmentation left by a preceding roseola. The erythematous patches in certain situations may, as the result of traumatism, become fissured, covered with crusts, or become converted into mucous patches. The diagnosis is not difficult if the general symptoms and the special features mentioned above are carefully considered.

¹ It must be remembered that, as in acquired syphilis, certain of these eruptions may coexist or be evolved one from the other, etc.

The **papular syphiloderm** is an early symptom of the disease. It may exist alone or be present in connection with the erythematous eruption. The discrete, flat papule is the most frequent type; the small, acuminate papule, according to Taylor, being unusual, except as a relapsing lesion, or else late in the disease. The papules have the peculiar syphilitic tint and may be smooth, although in certain situations, *e. g.*, palms and soles, desquamation is a marked feature. About the anus and genitals and at the corners of the mouth, as well as in other regions subject to pressure or irritating influences, the papular lesion becomes transformed into the **mucons patch**, which does not differ materially from that observed in the acquired disease. Excoriations, fissures, and consequent loss of substance are not infrequent, and produce characteristic scars, especially about the nose and angles of the mouth.

The **vesicular syphiloderm** as an independent type is exceedingly rare, and is usually associated with other forms of eruption, or it may develop upon the papular lesion.

The **pustular syphiloderm** may occur as the only manifestation, or appear in connection with other eruptions; or it may develop from papular or vesicular lesions. Occurring early it has usually a grave significance. The head, face, palms, soles, trunk, and limbs may be affected, but it generally is more abundant on the face, thighs, and buttocks. On the face, and particularly about the mouth, the pustules run together to form crusted patches, under which there is a certain degree of ulceration. Discrete pustules form also upon the palms and soles, and in cachectic children they form around and under the free border of the nails.

Some authors describe a **furuncular syphiloderm**, which may constitute the sole visible evidence of the disease. Atkinson looks upon this process as related to the tubercular and gummatous infiltration.

The **bullous syphiloderm**, or the so-called syphilitic pemphigus, is an early and very grave expression of the hereditary affection. It is frequent. It is not common

upon the face and trunk, but seeks by predilection the palms and soles, whence it may travel up the forearms or legs.

The bullæ develop on dusky reddish areas as small vesicular, or sometimes pustular, elevations of the epidermis, and rapidly go on to form pea- or walnut-sized blebs having cloudy, purulent or even bloody contents. They have no uniformity of shape and may be either tense or flaccid. According to Taylor they are surrounded by a thickened rim of copper-colored integument. Symmetry is the rule. The non-specific pemphigus differs from the bullous syphiloderm in the fact that it does not occur on the palms and soles, in the serous character of the contents of the blebs, and in the absence of profound cachexia and other evidences of syphilis; besides the syphilitic eruption does not relapse, and is rarely seen after the twelfth week (Atkinson).

The **tubercular syphiloderm** is rare in hereditary syphilis and generally occurs late. Fournier states that tubercles are mostly to be seen on the face and the anterior surfaces of the legs. **Gummata**, when seen in hereditary syphilis, are usually late.

Treatment.—The treatment by inunction, as suggested by Sir Benjamin Brodie, undoubtedly gives the best results in the majority of cases. Brodie was in the habit of employing mercurial ointment of the strength of 1 drachm to 1 oz. of lard, which was spread over a flannel roller once a day, and bound around the child. Usually a piece of equal parts of unguentum hydrargyri and vaselin of the size of a hazelnut may be smeared over the flannel binder every day, taking care, however, to wash the parts daily with soap and warm water, and, if irritation of the skin should arise, to apply the ointment to a different region. This treatment should be continued for some time after all symptoms have passed away. Sometimes the condition of the skin, or other reasons, render the inunction cure inadmissible, in which case the drug may be administered by the mouth. For this purpose powders of mercury and chalk may be

prescribed in doses of from $\frac{1}{8}$ to $\frac{1}{4}$ gr., three times a day. This quantity may be increased or diminished according to circumstances. Keyes highly recommends a mixture of $\frac{1}{4}$ gr. of the bichloride of mercury dissolved in 6 oz. of water, of which a teaspoonful may be given hourly for the first day, then every two hours, and finally every three hours, or at longer intervals, unless it obviously disagrees. Monti gives calomel in the following combination:

R—Hydrarg. chlor. mitis gr. jss
 Ferri lactatis gr. v
 Sacchari albi q. s.—M.

Ft. chart., No. x.

S.—One to four a day.

Kaposi recommends the tannate of mercury.

It may be administered in doses of from $\frac{1}{20}$ to $\frac{1}{8}$ gr. The employment of mercury by hypodermic injection is usually confined to those cases in which the symptoms are very urgent. Jacobi suggests for this purpose a solution of 1 to 2 parts of corrosive sublimate and 2 of chloride of sodium in 400 parts of water. From 10 to 15 drops may be injected daily. Corrosive-sublimate baths are of value especially as an aid to other methods of treatment. 7 to 30 gr., with an equal amount of ammonium chloride, are dissolved in some hot water, and added to a bath containing 8 gal. of water. The child should remain in the bath five to ten minutes and be warmly wrapped up when taken out. The bath may be repeated every second or third day.

Iodide of potassium alone, or in combination with mercury, is indicated in late gummatous and osseous lesions. It may be given well diluted in from 1- to 5-gr. doses a day, or combined with mercury.

R—Hydrarg. bichloridi gr. j-ij
 Potassii iodidi ʒss
 Syr. aurantii corticis,
 Aquæ aa ʒij—M

S.—Five to ten drops in plenty of water three times a day.

Taylor.

In whatever form the mercury is prescribed, its effects on the child must be closely watched. Upon the first

intimation of anemia, bowel trouble or general debility, the drug should be temporarily discontinued. Even if the patient is getting along favorably it is a good rule to suspend treatment for some days at the end of every month. The treatment should be continued for some time after all symptoms have disappeared, and the patient should be kept constantly under the eye of the physician so that, at the first evidence of relapse, treatment may be immediately resumed. Horwitz urges that a syphilitic child should undergo every year from four to six weeks of treatment until the age of puberty. There is much to be said in favor of this plan. Ulcerations should be treated with antiseptics and dusting powders. Affections of the mucous membranes, like "snuffles," should be treated by a 2 per cent. boric acid douche, and localized lesions touched with nitrate of silver or, better, mercuric nitrate, in suitable strength.

MYCOSIS FUNGOIDES.

Description.—This affection, first described by Alibert, in 1814, is among the rare diseases of the skin.

In its early stage the disease is characterized by certain ephemeral, or more permanent, cutaneous disturbances, that have eczematous, erythematous, urticarial, lichenoid or psoriasiform features; and afterward bright-red or pinkish, irregularly shaped and distributed patches appear. These may be small and isolated, or large and confluent. These patches in time become somewhat elevated above the surface, and are the seat of marked itching and burning.

This superficial stage of the disease may endure for months or years, but finally the infiltration increases, and leads to the formation of reddened, thickened plaques. These lesions come and go more or less rapidly. The tumors that constitute the characteristic feature of the affection may be developed from these infiltrations, or they may appear on hitherto uninvolved regions of the skin. The tumors are of a bright or dark red, sometimes bluish.

red color, and were compared by Alibert to tomatoes. They are sharply defined, ovalish or hemispherical, and vary from pea to orange size. Their epidermal covering is smooth and shiny, or the surface may be excoriated and give off a thin, serous, bloody discharge, with the formation of a crust. Suppuration is rare. At this time subjective sensations are slight. The tumors sometimes grow rapidly, sometimes very slowly, but having attained a certain dimension, spontaneous involution is the rule, leaving no trace behind. The disease, however, is kept up by the continual reappearance of new lesions.

Painless enlargement of the lymphatic glands is present in most cases. The general health may remain fairly good for years, but finally the patient succumbs to increasing cachexia, only a few cases so far reported having recovered. The average duration of the disease is from five to eight years.

In another type of the disease the characteristic tumors may be the first evidence of the malady. They do not disappear as in the form just described, and death ensues in from a few months to one or two years.

The disease does not appear to be contagious. Most of the cases have been in males over thirty years old, although the three cases that we have had under our care were in women. A number of microorganisms have been observed in the affected tissues, but none has yet been shown to have a causative relation to the disease.

The tumors are made up of round cells lying in the interspaces of a delicate reticulum. The growth was formerly regarded as a lymphosarcoma, but is now thought to be a granuloma.

In its erythematous stage mycosis fungoides may greatly resemble eczema, but the patches are more defined, more infiltrated, and less weeping than in the latter disease. After the tumors have formed the disease may resemble generalized sarcoma or leprosy.

Prognosis.—The prognosis is bad. The cases in which the formation of tumors is the first evidence of the disease

run a more rapid course than those in which there is a premycotic stage.

Treatment.—Up to the present time no **internal treatment** has proved of much avail, although Koebner and Geber each report the case of a patient apparently cured by the hypodermic injection of arsenic, and Crocker saw the disease disappear after purgation in one instance. The last-mentioned authority advises salicin in the pre-ulcerative stage, but after ulceration has begun neither salicin nor other drugs seem to be of any value. In one of our cases thyroid extract appeared to do good in the beginning, but later apparently had no influence on the course of the disease.

Bazin's observation of a cure after erysipelas encouraged one of us to use the Coley toxins in one case; no good effect was apparent.

The ulcerations may be dressed with the usual anti-septic powders, such as xeroform or aristol, or these drugs may be used in salve form. The itching may be greatly relieved by painting on a paste of oxide of zinc, $\frac{1}{2}$ oz., with 2 oz. each of mucilage of acacia and glycerin, and 1 or 2 per cent. of carbolic acid. A lotion of menthol and carbolic acid (see urticaria) is also useful.

One must hail with delight the *x*-rays as a measure which holds forth a promise of relief in this hitherto incoercible and most horrible malady. Scholtz, in 1902, reported 3 cases treated by *x*-rays. Small tumors disappeared under raying of necrotizing intensity. In 2 of these, however, new foci appeared at other points. Jamieson, Hyde, Marsh, Stainer, Elliot, Carrier, Dubois-Havenith, Belot, and Pusey have reported cures, and some six other observers, favorable results. The agonizing pruritus was in all cases relieved or lessened. The treatment is apparently beneficial at all stages of the disease. Belot gave each tumor a large dose, allowing twelve to twenty days to elapse between sittings. According to Lustgarten, "a single twenty-minute exposure will produce a dermatitis on any part of the body, followed by complete disappear-

ance of the lesion." Others have witnessed good effects without appreciable reaction.

Jackson and others have noted recurrence after raying. Again, the results have been apparently permanent.

SARCOMA CUTIS.

Description.—Owing to the many clinical varieties that are encountered, it is a matter of some difficulty to present a satisfactory description of the affection.

In most instances sarcoma of the skin is secondary to a similar growth in some other organ. Not infrequently, however, the disease occurs primarily in the skin. Clinically, sarcomata of the skin may be divided into the pigmented and the non-pigmented forms.

Melanotic Sarcoma.—This is the most frequent type of the disease. These growths may occur in vascular or warty moles, or spring from the apparently healthy skin. According to Fordyce the uveal tract is the point of origin of more than one-half of the pigmented sarcomata of the skin.

Starting from a mole, a spongy, black tumor develops. In the course of a few weeks or months, generally first adjacent to the original lesion, numbers of small, firm, pigmented masses appear. These small tumors run into larger masses, ulceration occurs, the lymphatics become affected, and, after involving the skin more or less generally, metastasis to internal organs occurs. This form of sarcoma is generally rapidly fatal. Hutchinson has described, under the title of **melanotic whitlow**, a special type of melanotic sarcoma that begins as a chronic onychitis with a slight pigmentation; gradually a dark, fungating tumor develops, and the sarcoma subsequently becomes generalized. Unna thinks that all malignant new growths originating from moles are probably carcinomatous, but this opinion has been disputed.

Non-pigmented Sarcoma.—Non-pigmented sarcoma may exist as a single growth, or large numbers of tumors may

be present. In some cases the first tumor springs from a mole or scar which has been irritated. About this other tumors develop until a whole part or extremity is thickly studded with them. The individual growths vary from pea to pigeon's egg size or larger, are smoothly round or lobulated, and usually firm to the touch. The skin over the lesion is, at least in the earlier stages, normal in color, but as the malady progresses it assumes a livid or reddish hue. In the course of time the skin lying between the growths becomes swollen, red, and infiltrated. A limb may thus come to resemble a member affected with elephantiasis. In a few months the nodules coalesce, break down, and ulcerate. The clinical history and appearance of this form of the disease will vary much according to the number of tumors and their anatomical constitution.

The course is usually toward a rapidly fatal issue.

Localized Non-pigmented Sarcoma.—This type of sarcoma may follow a blow or develop from a nevus or other lesion of the skin. The growth rarely reaches a size larger than an orange. The skin over the tumor may be normal in color or of a darker hue. After a variable time ulceration occurs, and secondary tumors form in the skin, viscera, or lymphatics. It should be mentioned that both in **leukemia** and **pseudoleukemia**, tumors and plaques of infiltration, probably sarcomatous in their histology, may develop in the skin and other organs.

Idiopathic Multiple Pigmented Sarcoma.—This form of the disease, first described by Kaposi,¹ is very infrequent. It generally occurs in males and in middle life, and manifests itself in the beginning in the shape of reddish-brown, or plum-colored, pea-sized tumors, on the flexor or extensor surfaces of the hands or feet. Similar tumors appear on the legs, arms, and thighs before the trunk or face is invaded. In a case seen by one of us telangiectases ramified over the infiltrated plaques on the face. The tumors rarely ulcerate, but they often undergo involution, leaving pigmented scars.

¹ This affection was later called, by Kaposi, **Sarcoma Idiopathicum Multiplex Hemorrhagicum**.

When, in the course of two or three years, the lesions appear on the trunk and face, the fatal termination is near. The tumors may form upon the mucous membranes. Sooner or later dysenteric symptoms, fever, marasmus, etc., set in and the patient succumbs. All cases, it must be noted, do not end in death. One of us reported an example of this disease in which the growths underwent spontaneous involution and the patient remained well after sixteen years.¹ Brayton records a case in which the disease had existed for twenty-five years, some of the lesions disappearing, from time to time, while new ones developed.² In arriving at a diagnosis it is important to differentiate the large papular and the gummatous syphilide, mycosis fungoides, leprosy and, perhaps, lupus.

Treatment.—The treatment of melanotic sarcoma after dissemination is futile. There may be some chance of cure if the preliminary growth is removed at an early date. Moles and warty growths, especially on the face, should be removed as a precautionary measure under any circumstances, and all the more so if a pigmented mole, for example, should show signs of beginning irritation.

Fordyce advises arsenic by the mouth or hypodermically for non-pigmented sarcoma. We, personally, have seen no good results from its use. Koebner, Lustgarten, Hyde, and others have reported cures of idiopathic multiple sarcoma following the administration of arsenic hypodermically. We think this treatment should always be tried; but of 2 patients treated by one of us,³ 1, to whom arsenic was faithfully administered, died, while the other, who received absolutely no treatment at all, recovered.

Coley's treatment by the mixed toxins of erysipelas and the *Bacillus prodigiosus* has yielded some astonishing results in the spindle-celled variety, but is less efficient in other forms. One of us witnessed a cure in a rapidly

¹ Hardaway. *Journal of Cutaneous Diseases*, p. 1, 1883, and p. 21, 1890. This man is still living and in good health (1907).

² *Indiana Medical Journal*, November, 1893.

³ Hardaway.

growing lesion, without recurrence, the patient dying eight years later of another malady. The reactions are sharp and severe, but without ulterior bad effects. In our opinion the method should always be given a thorough trial. It should be distinctly understood that erysipelas cannot be conveyed by this method, as the living streptococci are not employed. This agent is more fully considered in Part II.

The trypsin treatment (see Part II) may be given a trial when the mixed toxins fail.

Reports on the efficacy of the **x-rays** in this neoplasm are somewhat conflicting. While most authorities, with whom our experience leads us to agree, believe sarcoma to be less amenable to irradiation than carcinoma (thus Codman collects 35 cases, of which 15 were improved and 20 unimproved), a few, among whom Holzknecht, express a contrary opinion. Morton holds that the two respond similarly to treatment. This divergence is largely referable to the fact that sarcomata differ widely in structure. Kienböck finds that "round-celled sarcomata and endotheliomata of the face, originating in the oral or buccal cavities, are particularly influenced by radiotherapy." Radium was successfully employed in melanosarcoma in the late Professor Gussenbauer's Vienna clinic.

Sarcoma presenting such a variety in kind, size, and location, it is evident that no general rules for treatment can be laid down, except that they should be surgically removed whenever practicable, after which the rays may be employed to diminish the chances of recurrence, without awaiting cicatrization. Allen states that recurrence is the rule.

LEPROSY.

Description.—Lepra or leprosy is a chronic, endemic, specific disease characterized by various alterations in the tissues and organs of the body, and usually ending in death. Although all forms of the disease are due to the same cause, it is convenient on clinical grounds to divide leprosy into

(1) the tubercular or nodular, (2) the anesthetic or nervous, and (3) the mixed types.

Nodular Leprosy.—After a variable period of general malaise, dyspepsia, constipation or diarrhea, vertigo, profuse perspiration or local anidrosis, general infection of the system is declared by a chill and a rise of temperature to 103° or 104° F. These symptoms may last days, weeks, or months before the leprous exanthem makes its appearance. The eruption is usually situated on the face, ears, trunk, and extremities, and consists of erythematous, hyperesthetic, sharply limited macules of a reddish-brown color, and varying in size from a bean or less to several inches in diameter.

The first crop of eruption may fade away, to be followed, with renewed febrile exacerbation, by others, or the lesions may change to a permanent brownish-red stain; and these various processes may continue for months without further alterations. The spots are often hyperesthetic at first, and later may become anesthetic. This latter condition may be detected in apparently normal regions of integument.

Finally, however, tubercles in the shape of pale, red, very small elevations, which enlarge to the size of a pea or filbert, of a brownish color, make their appearance. These may occur anywhere, but the face, penis, scrotum, breasts, and limbs are the most usual sites of development. The individual lesions may attain great size, or by coalescence may form larger, irregular, nodulated masses. On the other hand, the original erythematous patches may become profoundly infiltrated, brownish elevations.

The leprous deposit also occurs on any of the mucous membranes, and produces quite characteristic symptoms when the cavity of the nose and the larynx are involved. In most cases, owing to the excessive deposit of leprous nodules and thickenings on the face, the countenance assumes the well-marked leonine expression, giving an aspect of brutality to the unfortunate sufferer that is repulsive in the extreme. As a result of various circumstances, the course of the tubercles may present very different ter-

minations. Sometimes the lesions undergo involution, leaving brown macules in their wake, or atrophic scars, or, what is very usual, ulceration may take place, the ulcers being superficial, indolent, and healing only after a long time, often only to break down again. The lymphatic glands become enormously enlarged. From time to time acute exacerbations occur, new tubercles appearing after each attack, but usually with diminishing frequency as the disorder advances, to cease altogether after five or six years (Hillis). After months or years, with progressive emaciation, the patient will succumb, either directly from extensive ulcerations, from interference with the respiratory function, to some intercurrent affection, or from disorders of internal organs due to invasion of the lepra bacillus. The features of the anesthetic or nervous form of the disease may, at any time, be superadded, thus producing what is called the "mixed variety." Nodular leprosy lasts, on an average, about nine years.

Anesthetic Leprosy.—Febrile symptoms are absent in nerve leprosy as a rule, but the patient complains much of uncomfortable feelings of chilliness, and suffers more or less from ill-defined gastric and other disturbances. Lancing pains are felt in various parts, together with sensations of numbness or burning. Muscular weakness is an early symptom. Numerous small blebs make their appearance on the extremities, which later in the disease assume considerable proportions. After a time erythematous spots and patches come out on the trunk, limbs, and face. They have a certain resemblance to the lesions of erythema multiforme, but are larger and more irregular. The macules are one or two inches in diameter, and later by coalescence may cover large areas, the first spots disappearing and reappearing, and new lesions developing from time to time. It is said that the patches are rarely insensitive at this time, but that the secretion of sweat is absent. Anesthesia is often apparent in places where no noted changes have occurred in the skin, especially regions supplied with cutaneous nerves from the ulnar and pero-

neal. In the spreading state of the malady the spots enlarge peripherally, the borders are raised, studded with papules or vesicles, and the centres become hairless, wrinkled, dry, atrophic, and covered with white, furfuraceous scales. In addition to the well-marked anesthesia that is now present, large bullæ form, mostly on the extremities. Owing to the presence of leprous deposits in the nerves, these latter, especially the ulnar, become enlarged, and can be plainly felt under the skin. Muscular atrophy is a prominent symptom, the wasting being first visible in the thenar and hypothenar eminences, and involving the muscles of the hand, forearm, and even the upper arm.

Motor paralysis, especially of the facial nerve, may be combined with the sensory, and after awhile the mimic muscles of the face are implicated. Finally, after the various local processes have been long established—*e. g.*, anesthesia, analgesia, and atrophy—the osseous system becomes involved, and there arises the combination of symptoms called *lepra mutilans*.

Sometimes the deep ulcers left by the bullæ extend and cause profound destruction of the connective tissue, muscles and fasciæ, and in certain situations, such as the ankles, wrists, and feet, bones are laid bare and caries appears. As the wounds are not painful, they are often neglected, and large parts of the bone may be destroyed, the articular cavities are opened, and spontaneous amputations occur. In other instances, after the anesthesia has become pronounced, swellings will appear around the phalanges and the metacarpal and metatarsal bones, which will finally turn livid, fluctuate and burst, and the denuded bones may be seen or felt, and finally be cast off.

Gradually, as the case advances, the symptoms of general marasmus supervene, and the patient dies from exhaustion or else is carried off by some intercurrent disease. In a few instances the disease may be arrested after having progressed to a certain extent, or even after marked changes have taken place. After a time anesthetic leprosy may become complicated with the tuberoso variety. The

duration of the anesthetic or nervous form of leprosy may be from eighteen to nineteen years.

Mixed Leprosy.—As already stated, in some cases the features of tuberculated and anesthetic leprosy may be conjoined. This state may begin with one form or the other of the two chief types of the disease, or it may present both forms from the beginning, in which case its progress is more rapid. It is now conceded that the direct exciting cause of leprosy is the bacillus discovered by A. Hansen, in 1874.

No initial lesion has ever been detected in leprosy, and the method of the introduction of the disease into the body is unknown. It is presumed that the exhalations from the nose and mouth may be, in some instances, responsible for contagion, and that the bacillus may also gain an entrance through abrasions of the skin and through ingestion of food.

A few words in regard to the **diagnosis** of leprosy may not be out of place in this connection.

In countries where leprosy prevails as an epidemic the prodromic symptoms are always likely to arouse suspicion, but where the disease is occasional, they are apt to be confounded with malaria or rheumatism until the appearance of the more distinctive features of the disease, such as anesthesia and leprous macules, puts the diagnosis at rest. It is quite possible to mistake macular leprosy for exudative erythema and the erythematous syphilide, but in neither of these conditions is there any alteration of cutaneous sensibility—that is, hyperesthesia or anesthesia—and the appearance of the lesions is different; besides, as regards syphilis, there would at this time be other symptoms present.

Tubercular syphilis and nodular leprosy bear a close resemblance if considered superficially, but the tubercles of lepra have especial sites where those of syphilis are rarely found; their course is slower, and anesthesia may be present. The nodules of lupus have a more chronic history, a dissimilar course, and a different arrangement.

In ulcerative lesions of the palate and nose the history of the case and the concomitant symptoms must receive due weight in reaching a conclusion.

Leprosy should also be differentiated from syringomyelia, leucoderma, morphea, pemphigus, and progressive muscular atrophy. Examination for the *lepra bacillus* should always be made.

Treatment.¹—Until recent years the treatment of leprosy was based purely upon sanitary methods directed chiefly at the protection of the public at the expense of the victim of the disease. The popular conception of the affliction, implanted by the vague but graphic descriptions contained in the Bible, were shared in large part by the medical profession. Here and there some essays at treatment were early recorded, but with lack of exactness in procedure, so as to practically render them of little value. Still, most intelligent governments segregate those affected with leprosy in asylums, hospitals, and colonies which are conducted with varying degrees of care, medical and otherwise. The humanitarian episode of Father Damien's career occasioned a wholesale investigation of the disease on the part of the British government in the later '80's, resulting in an exhaustive report which largely educated those interested in the methods of the spread of the disease and in the modes of treatment then in vogue. The Conference of Berlin, in 1897, further exploited the pathology, symptomatology, and therapy of this disease.

With the discovery of the *bacillus* of leprosy, a tangible point of attack was determined, and various theories have been born and spread directed at serum treatment.

It is absolutely conceded that the segregation of lepers in wholesome colonies does succeed in reducing the numerical importance of the disease as well as the danger of spread among susceptible people. Neither climate, diet nor environment seem to be primary factors so far as the disease is concerned; the consensus of opinion points to a

¹ By Isadore Dyer, Ph.D., M.D., of New Orleans.

direct acquisition of the bacilli through the respiratory tract by way of the nose and mouth. The advantages obtained in systematic treatment, hygienic care and diet, which can be imposed in an asylum for lepers, point to segregation in such an institution as the best means of accomplishing results in a therapeutic way. The case which is individualized usually fails in systematic care and is apt to run the course natural to a virulent disease, aggressive in type and progressive in its destructive tendencies.

Particular treatment of leprosy must depend upon the individual patient, not necessarily upon the type of the disease. The basis of treatment seems to depend upon the law of resistance in the individual. Like tuberculosis and syphilis, leprosy tends to be self-limited; in some cases running a natural course of expression of the disease, undergoing gradual elimination, until the victim survives the disease, either with no evidence of its presence, or with various degrees of those sequelæ which are common to explosive types. This may go on to actual mutilation, stop with this, and never again show active evidences in the leper.

As with the two diseases referred to, leprosy more often finds focuses for the deposit of its bacilli, and these colonize to the extent of provoking systemic disturbances, nerve disorders, and disfigurement of the cutaneous surfaces. So long as fresh colonies of the bacilli find proper nutrition they go on developing; but if a resistance can be established, the areas of the disease become circumscribed, the bacilli are starved, resolution occurs, and the patient may get well, as happens in the cases reported from the various centres infected with this disease.

The treatment of leprosy is based upon the personal hygiene of the patient, the introduction into the economy of sera, or drugs, and the immediate application to the manifestations of the disease of destructive agents, absorbents, or other treatment directed at producing their resolution.

The sera so far advanced have one and another failed in their uniform application to the disease. Among these

may be mentioned prominently that of Carasquilla, of Bogota, United States of Colombia, and the "leprolin" of Rost, of Rangoon, India. Both of these are derived from the fresh tubercle of leprosy, the first through attenuating the bacillus; the second, consisting in the employment of by-products derived from cultures in various media. Carasquilla, himself, obtained results which were noteworthy, but no one else succeeded as he did, either with serum made by him, or by his method. Rost reported a large number of cases treated, in a good percentage of which rapid results were obtained, but, later, he himself found that these results were not permanent.

The experience of the writer of this article with snake venom is a matter of record. Influenced by the popular superstitions with regard to the influence of snake venom derived from the actual bite of the reptile, and also by the experience of Carreau with a leper bitten by a viper in Jamaica, experiments were conducted in a series of cases injected with the antivenomous serum of Calmette obtained from the Pasteur Institute at Lisle, France. The results are related in detail in the report made to the Berlin Conference¹ and in a more recent paper.²

Among the drugs used in the treatment of leprosy may be mentioned ichthyol, salicylate of soda, arsenic, strychnine, hoang-nan, mercurial salts, chaulmoogra oil, gurgjun oil, red mangrove, tua-tua, chlorate of potash, euophen, and iodine salts. Of these the chaulmoogra oil has been most extensively used and over a longer period of time. The properties of chaulmoogra oil (*gynocardia odorata*) have been known to the natives of India for a great many years.

The extensive demand for the oil has occasioned numerous substitutes, none of which seem to have the same virtues. Bibb, in his paper on the treatment of leprosy (Alvarenga Prize Essay, 1895) is emphatic in his expression of belief that this remedy is a specific for the disease. Our own experience would confirm a belief in its prime

¹ New Orleans Medical and Surgical Journal, October, 1897.

² The Cure of Leprosy, Medical News, July 29, 1905.

usefulness. Hutchinson has reported cases cured with arsenic; likewise Fox. Crocker has effected permanent results with hypodermic injections with the perchloride of mercury; Goldschmidt has obtained cures with euophen in oil, and various reports have been made of the excellent results observed after the administration of salicylate of soda.

After observation of the disease during nearly fifteen years, and with the successful treatment of 20 cases, 12 of which have been permanently cured, the author has arrived at the following observations with regard to this disease:

1. Full diet, restricting only indigestible foods, is indicated. The disease seems nowise to be affected by fish or any other particular article of diet.

2. Baths are essential in the treatment. Hot baths twice a day, with or without carbonate of soda, are effective.

3. The patient needs tonics, febrifuges, and should be watched for intercurrent or complicating diseases, such as malarial infection, pleurisy, pneumonia, la grippe, and the like.

4. Strychnine is a *sine qua non* in the treatment of leprosy. My assistants and I lay down the rule that a leper should always take strychnine—the sort and size of dose to be regulated by the patient himself.

5. When chaulmoogra oil is given, it is better endured before meals than after. It is best taken in capsules, in hot milk, or in milk of magnesia. The dosage should be begun with a small amount, say 3 drops, and increased every second or third day until as much as 120 to 150 drops of the oil are taken at the dose.

At times it is advisable to give the oil in pill form. This can be done either by combining it with the extract of nux vomica and ordinary excipients, or a very effective way is with tragacanth and common soap.

6. Above all things individualize the patient. Watch for improvement, and if it does not show in three months, wait six months; if it does not show in six months, wait a

year, or longer. But keep on driving at the treatment until the patient dies or gets well.

7. When all evidences of the disease are gone, insist on a continuance of treatment. It may not be necessary, but it makes sure.

Regarding the **local treatment** of leprosy, this must necessarily be considered as subsidiary to internal medication. There is undoubted benefit to be derived from frequent friction with chaulmoogra oil, olive oil, castor oil, etc., with energetic rubbing of the skin. There is evidently some aid in resolution of patent lesions, and undoubtedly a certain amount of absorption of the fatty substance itself. The iodide of lead ointment, used in the same way, is of marked value in certain cases.

With tubercles on the face, hands, or where these are discrete, the use of the Paquelin cautery is indicated for the further destruction of such lesions. The electric needle deeply introduced, and carbolic acid or iodine, freely injected in these growths, cause their resolution. The same object is attained by the Japanese through the use of "moxa," which are really the same as "punk," or closely packed waste, arranged like a wick and having a gummy substance at one end by means of which it may be applied to the area to be destroyed. These devices are ignited and burned to their base, incidentally destroying the lesion underneath. Bichloride of mercury in collodion, arsenical paste, the chloride of zinc, and strong nitric or hydrochloric acid are likewise used *in loco*.

Quite recently, Gilchrist, of the United States army, has used radiotherapy for the purpose of provoking the resolution of leprous tubercles, and has obtained favorable results. Reports have been made from Manila on the use of the x -rays, used in a diffuse way for the cure of the disease generally, cases being instanced in which manifestations of the disease have disappeared under the energetic employment of the x -rays. The theory of the action of this form of light treatment is unique. It argues that the destruction of the local manifestations of the disease results in the

absorption of the products of such destruction in the shape of dead bacilli and their media, which are carried into the active circulation and act as an engaging host against active bacilli in the internal organs and in remoter areas not directly open to the effect of the rays. The experiments are too few to be startling and need further confirmation to warrant the adoption of the method and the theory.¹

In conclusion, be it said, that the enlightenment of the intellectual division of the medical profession with regard to this particular disease has grown remarkably in the past thirty years, and the disease is no longer considered incurable. More than this, the laboratory has elucidated the exact method of invasion of the tissues and has pointed to the means of relief. It remains earnestly to devise exact methods of treatment to the end that this disease may be eradicated, or at any rate be removed from among the dangers to humanity.

COLLOID DEGENERATION OF THE SKIN.

Description.—This affection is characterized by small, shining, lemon-yellow papules that have the appearance of vesicles; but when pricked they exude no fluid, but a yellowish jelly. The disease seems to be limited to the upper part of the face, especially the forehead, malar regions, and the bridge of the nose. It should not be confounded with papular xanthoma, for in this latter disorder the lesions are not translucent in appearance, and the color is more subdued.

Treatment.—The treatment of colloid degeneration is to enucleate the deposit with a dermal curette, or to effect destruction by electrolysis.

¹ Grou, Sequeira, Crocker, and Oudin have observed improvement of irradiated lesions. Electricity has been applied to anesthetic patches. Beavan Rake has reported good results from nerve stretching.—W. A. H., J. G.

ADENOMA SEBACEUM.

Description.—This disorder is characterized by small growths having their origin in hyperplasia of the sebaceous glands. The lesions occur on the face, most abundantly at the sides of the nose, but they are also to be noted on the forehead and other parts of the face. As a rule, they are distributed symmetrically, but exceptionally they may be unilateral. The little tumors are firm to the touch, smooth or rough, whitish or yellowish, or of a bright-crimson hue from the development of telangiectases. The tumors present no apertures, but a little inspissated sebum may be pressed out after pricking. The growths are apparently congenital in some cases, or occur early in infancy, but an increase in their size and number is to be noted at puberty. No subjective symptoms are present. For the most part the tumors undergo no change, but spontaneous involution occurs sometimes in some of them. Fibromata, warts, nevi, and anomalies of pigmentation are often seen in connection with the affection. In many instances, the patients are epileptics or are otherwise mentally defective. An exact **diagnosis** is exceedingly difficult without a microscopic examination, but it is well to bear in mind the possibility of confounding adenoma sebaceum with colloid milium, multiple benign cystic epithelioma, acne rosacea, and the nodules of lupus vulgaris.

Treatment.—The treatment is by excision, curetting, the cautery, or preferably by electrolysis. Jamieson reported an apparent cure by the application of the following paste:

R—Resorcini	gr. xx
Zinci oxidi	gr. xl
Kaolini	gr. ij
Adipis benzoati	gr. xxviii—M.

In a recent case the same author employed the x-rays without result. Harrison and Wills benefited a case by phototherapy.

MULTIPLE BENIGN CYSTIC EPITHELIOMA.

Description.—The disorder has been described under a great variety of names, viz., hydradenomes éruptifs, syringo-cystadenoma, epithelioma adenoides cysticum, etc.

According to Fordyce, the malady affects the face, chest, back, and upper extremities, and is characterized by small, pale-yellow, pearly or pinkish-colored tumors varying in size from a pin's head to a pea. The little growths are embedded in the skin and project above the surface. They are firm to the touch and painless, the larger tumors being tense, shiny, freely movable, and occasionally exhibiting a central depression. Some of them are translucent and look like vesicles; others are made up of milium-like bodies and are traversed by small vessels. The disease makes its appearance at or before puberty. In one of our cases the disease first appeared at the fourteenth year. The tumors enlarge until they reach the size of a pea, rarely greater, never undergo involution, and only exceptionally ulceration. They show little tendency to malignancy. The tumors bear no relation to the sweat glands, but represent, histologically, an epithelioma of the skin, accompanied by colloid degeneration and the formation of small cysts (Bowen).

The lesions may be **treated** by the cautery, curette, or incision with expression of the contents. Electrolysis has answered better in our hands.

Pusey caused the disappearance of a number of growths in one case by the α -rays.

LEUCOKERATOSIS BUCCALIS.

Description.—This affection, also known as leucoplakia, psoriasis linguæ, ichthyosis linguæ, and smokers' patches, was first described by Bazin in 1868, and later more especially by Debove, Schwimmer, and others. Although Schwimmer is of opinion that the disease makes its first

appearance in the form of dark-red spots, this is not the common experience, but, on the contrary, the lesions seem to be from the beginning of a pearly or slate-gray color. The lesions vary in size from a small point to areas covering extensive regions of the affected parts. Any part of the oral mucous membrane may be attacked, even the gums, but a common site is the tongue and that portion of the cheek on a line with the teeth when the latter are closed. The patches in the beginning are usually well defined, irregular in outline, barely elevated, and somewhat dry and rough; but the epithelium may be peeled off, displaying a smooth, red surface that is apt to bleed. At an advanced stage of the disease, cracks may develop and the parts become stiff and dry. Hypertrophy of the papillæ of the tongue may occur and may take on a nodular appearance.

Sometimes the patches may pass unobserved and the disease remain quiescent, and even in rare instances entirely disappear. On the other hand, the condition of leucokeratosis may be general from the beginning. Again, it may rapidly spread by extension of single lesions or by the confluence of several. Epitheliomatous degeneration is always to be feared in these cases, appearing as a development out of a warty outgrowth, from a submucous nodule, or in the shape of an ulcer with indurated borders. Leloir thinks that the epitheliomatous change is due indirectly to chronic irritation and is not an essential development from the hyperkeratotic condition. This disorder occurs mainly in the middle period of life and in the male sex. Syphilis and tobacco-smoking are the usually assigned causes of the malady, but it is known that it may occur independently of either of these conditions. Among exciting, or at least complicating, factors may be mentioned spiced foods, strong drinks, the irritation of ill-fitting dental plates, etc.

Treatment.—The constitutional treatment by antisiphilitic remedies, even in cases with a specific history, is usually without good results, and if pushed too far may prove harmful. Obvious derangements of the alimentary canal

should receive attention, the mouth and teeth should be looked after, and the use of alcohol and tobacco and highly spiced foods prohibited.

In mild cases, slightly astringent washes may be prescribed, or the patient may hold in his mouth, from time to time, a lozenge made of the Australian red gum.

Under such management some cases recover or else give no further trouble. Treatment by caustics or other heroic measures should be avoided, but exceptionally cracks and ulcers may be lightly touched with lunar caustic or tincture of iodine. Suspicious growths or indurated ulcers should be removed by surgical means.

It is fair to say that some physicians advise more or less energetic treatment, especially when considerable thickening has occurred.

Vidal recommended a 20 per cent. chromic acid solution, and Sherwell advises the application of liquor hydrargyri nitratis for fifteen or twenty minutes at a time, after which it is neutralized with bicarbonate of sodium. The rest of the mouth is protected with absorbent cotton. Leistikow prescribes this paste:

R—Terræ siliciæ	3jss
Resorcini	3iij
Adipis	3ss—M.

The remedy is to be applied with a piece of wood several times a day, especially after meals and at bedtime. After a season the use of the paste becomes painful, when it is to be stopped and the mouth washed quite frequently with borax-peppermint water, and balsam of Peru applied to the patch.

Bockhardt applies balsam of Peru daily, or every other day, and orders that the mouth be washed out one-half dozen or more times a day with a $\frac{1}{2}$ to 3 per cent. salt solution. Abstinence from tobacco must be absolute. Pencilling on the affected parts a 20 per cent. solution of iodide of potassium has also been suggested. Stelwagon thinks highly of the galvanocautery in appropriate cases

The *x*-ray has been used in the treatment of leucoplakia with varying success. Our own experience has not been altogether satisfactory.

KERATOSIS FOLLIULARIS (DARIER'S DISEASE).

Description.—Keratosis follicularis is characterized, as regards its lesions, by the appearance of pin-head-sized, solid papules that in the beginning differ little in color from the rest of the skin, but later, after increasing in size, they take on a darker hue, and are covered with a hard, grayish or blackish scale that dips down into the duct of the pilosebaceous follicle.

The lesions may be found upon any part of the body, but certain localities, such as the face, scalp, breast, and inguinal and hypogastric regions are preferentially attacked. In a large number of cases the initial point of attack was the head and face, thence extending downward.

Corresponding with the deepening in color and increase in the size of the lesions, they also tend to run together, and display here and there spine-like projections and even horny excrescences. In certain localities, such as behind the ears, and in the hypogastric and inguinal regions, the eruption may take on a papillomatous aspect and ulceration may occur. On the scalp, the disease suggests a seborrheal eczema. The backs of the hands also show verrucous elevations, and sometimes plaques of thickened, scaly skin, and the palms and soles may be affected, though to a less degree. The nails are thickened and furrowed, and quite brittle. The disease, with periods of quiet and stages of exacerbation, progresses slowly but surely until most of the body is involved. Itching is usually slight, but pain may occur from the presence of ulcerations. A disagreeable odor is often to be noted. The general health is usually good.

The disease makes its appearance before the sixteenth year; in a patient seen by one of us it was first noticed at

the sixth year. Darier's idea that the disease is due to psorosperms has now been abandoned, and it is today regarded as a keratosis "or modified cornification of the epithelial layers having its seat in the mouths of the pilosebaceous ducts" (Stelwagon).

Prognosis.—The prognosis is unfavorable as regards the cure of the disease, but the patient's general health is not materially affected.

Treatment.—The treatment of this affection has heretofore been very unpromising. **Locally**, it consists for the most part in the taking of warm alkaline baths, and the application of such remedies as salicylic acid, resorcin, pyrogallol, sulphur, etc. Leredde mentions a case that was apparently cured by the vigorous use of resorcin and sulphur pastes and lotions. Recently Mook has reported favorably upon the employment of the *x*-rays. In a patient under the care of one of us this form of treatment was begun, but the patient, a case from the clinic, disappeared before we could come to any conclusion as to the results. We are convinced, however, that this will be the treatment of choice in the future. Inasmuch as in the case just mentioned the condition almost disappeared each winter, it is possible that residence in a northern climate might sometimes be beneficial.

KERATOSIS FOLLICULARIS CONTAGIOSA.

Description.—H. G. Brooke, under this title, has called attention to an abnormality of cornification, which he has observed as a contagious affection in children. The disease appeared on the extensor surfaces of the limbs, the neck and trunk, but also extended to other parts.

In the involved regions there was a general thickening of the skin, with exaggeration of the natural lines. Within the areas thus formed, small black spots were visible, which finally became raised into papules, and the whole of the affected region took on a dirty yellow color. From these

papules, in most instances, a spine projected, and some of them became subacutely inflamed. In some situations, instead of spines, the larger papules presented comedo-like, horny plugs.

These features were more or less evident in all the cases, and its contagious nature seems to be beyond doubt. The process in a hyperplasia of the epithelial cells combined with a modification of cornification.

The **treatment**, which was effectual, consisted in inunctions of mollin.

MOLLUSCUM EPITHELIALE.

Description.—This disease is also known by the names of molluscum sebaceum and molluscum contagiosum. It is a very striking disorder, and once seen is not to be forgotten. The lesions in the beginning are very small, of pin-head size, perhaps, of a pinkish or whitish color, but in the course of weeks or months they may get to be as big as a pea, although exceptionally they may be somewhat larger. Generally they are sessile, and the skin over them is stretched and glistening, giving the little tumors the appearance of drops of wax. To the touch they are firm, but they become softer as they grow older. In most instances the lesions are umbilicated, with a central spot indicating the mouth of the follicle. From the central aperture of larger tumors a milky or gruel-like fluid may be squeezed. By slightly enlarging the orifice, a waxy, pinkish mass may be expressed. The mollusca may finally inflame and discharge their contents through supuration. The growths are usually few in number, occur mostly in children, and are chiefly to be found on the face, especially the eyelids, cheeks, and chin, but they are also met with on the neck, breasts, and genitals. Sometimes hundreds of tumors have been counted, and occasionally the lesions have been of extraordinary size (W. G. Smith). Subjective symptoms are absent.

Molluscum epitheliale is commoner in children than in adults, and it is said to be more often seen in females than males.

It is quite generally conceded that the disease is parasitic and contagious, although no definite parasite has been discovered. At the present time, most observers are agreed that molluscum epitheliale is not a protozoan disease, but that the "molluscum bodies" are the result of changes in the epithelial cells.

Prognosis.—A radical cure may confidently be predicted, but if the destruction is ineffectual the growths are prone to reappear.

Treatment.—The little tumors may be slit up with a knife, the contents expressed, and the base touched with nitrate of silver. The cautery or curette may be used. Electrolysis is also effectual. In some instances, an ointment of ammoniated mercury, 20 to 30 gr. to 1 oz., will cause the little tumors to disappear. The salve should be applied with slight friction.

CARCINOMA CUTIS.

Description.—Carcinoma of the skin occurs as scirrhus and epithelioma. Scirrhus is rare, and is usually secondary to some deposit in other parts, such as the breast. This form of cancer in reality often affects the subcutaneous tissue more than the true skin. In its etiology and anatomy it does not differ from scirrhus affecting other organs. Two varieties of scirrhus of the skin are recognized: the **lenticular** and the **tuberoso**.

A **melanotic** or **pigmented carcinoma** is also occasionally encountered.

Treatment.—The treatment of these conditions is not promising. When practicable, and in the beginning, excision is demanded. As a rule, however, surgical interference is useless, the various types tending to wide dissemination. Arsenic by the mouth or hypodermically,

or the Beard treatment might be tried. Pusey has obtained some symptomatic cures with the *x*-rays, which had lasted over five years when reported.

EPITHELIOMA.

Description.—The clinical appearances presented by epithelioma vary according to the stage of the disease, its situation, and its anatomical peculiarities. It is usual to describe these variations under three heads: superficial epithelioma, deeply seated epithelioma, and papillary epithelioma.

The **superficial** form of the disorder often first appears as yellowish, reddish, sometimes waxy papules of the size of a pin's head or larger. Several such papules or tubercles may coalesce to form a small, lobulated tumor over and around which dilated vessels may be seen. At other times this variety of epithelioma may have its origin in a wart, mole, or flat infiltration of the skin, or seborrheic patch. After a variable time a crust forms upon the lesion, which, when removed, exposes a shallow, red, superficial ulceration, the edges and base having a thin, though firm induration. The growth may remain in this condition for a long period before an extension of the ulceration occurs, which is often accomplished by the formation of a shallow ulcer with a waxy or pearl-like, rolled border. The floor of the lesion exudes a thick, varnish-like secretion, which dries into a fairly consistent crust. As a rule, superficial epithelioma extends in depth only after a long period, but, unchecked, it may in time cause great destruction. In some occasional cases a certain amount of cicatricial repair occurs in the wake of the advancing disease.

In the earlier stages, pain is not pronounced, but later on this symptom may add greatly to the evils of the patient's condition. There is no tendency to involvement of the lymphatics, the disease remaining wholly local. When life is destroyed it is because a vital organ has been involved, or else the patient sinks from gradual exhaustion.

The superficial form of epithelioma occurs most often on the face, although it may be found upon other parts of the body.

A certain clinical variety of superficial epithelioma has been called **rodent ulcer**, and some good authorities still look upon it as clinically and anatomically distinct. Rodent ulcer is to be regarded as an epithelioma which presents the clinical peculiarities of being extremely slow in growth, not as a rule painful, and with little tendency to new growth as compared to the amount of destruction.

The **deep-seated** epithelioma may develop from the superficial form, but more commonly it commences as an infiltration set deep in the skin. The growth may in the beginning lie in the subcutaneous tissue, or it may project above the skin as a round or flat or lobulated tumor. The skin over it is reddish or purple, and dilated vessels are often seen running over the surface. The tumor is very hard to the touch, and though at first freely movable over the deeper structures, in the course of time it becomes firmly adherent. Ulceration is the ultimate result of the morbid process. The appearance of the ulcer differs much in different cases. Generally the edges are everted, irregular, infiltrated and of a livid color, while the floor is uneven and may be covered with a crust. There is a thin, viscid discharge, which becomes purulent and offensive if the necrosis is rapid.

The course of this variety of epithelioma is much more rapid than that of the superficial form. The lymphatics become involved, cachexia is established, and the patient dies in the course of a few months, or at most at the end of three or four years. This form of epithelioma is painful, often severely so, from the first.

The common sites for deep-seated epithelioma are the lower lip, the tongue, and the external genitals, though it may occur upon any part of the body.

In either one of the above-described forms of epithelioma the papillæ may become greatly hypertrophied, giving to the cancer a peculiar appearance to which the name

papillary epithelioma is applied. Sometimes the enlarged papillæ are present from the first; this is especially apt to be the case if the cancer has originated from a wart. The papillary epithelioma may be sessile or pedunculated. Its color is usually a bright red, and the tumor bleeds easily. Between the papillæ fissures form, from which issues a sticky, sanguinolent and offensive discharge. The base upon which the papillæ are situated is infiltrated. In the course of time the tissue breaks down, with the formation of an ulcer which pursues the usual course of an epitheliomatous ulcer.

Heredity plays a smaller part in the **etiology** of cancer than was at one time supposed. Cancers of the skin, like carcinomata of other organs, are in some way intimately associated with the retrogressive changes of declining life. Thus, rarely does an epithelioma of the skin occur before the fortieth year.¹ Epitheliomata are prone to form at points which are subject to constant irritation; epithelioma of the lower lip is common among pipe smokers. Certain occupations predispose to epithelioma, because they afford means for local irritation. We have seen how often epitheliomata begin in warts and moles. Other neoplasms, such as cutaneous horns, sebaceous cysts and scars, are frequently the starting points for these growths.

Today the idea that cancer is of parasitic origin is not so general as it was some years ago. It is, moreover, evident that for cancer to attack the organism something more than the inoculation of a parasite is necessary, namely, predisposition.

Diagnosis.—The surest way of making a **diagnosis** of epithelioma is by submitting portions of the tumor to a microscopic examination. Clinically, epithelioma must be distinguished from lupus, syphilis, innocent papillomata,

¹ Hartzell, however (New York Medical Journal, March 5, 1898), reports a case of epithelioma (rodent ulcer) in a boy of fourteen years, and quotes a number of instances of early attacks found in literature. It would seem that the so-called rodent ulcer has a tendency to occur earlier than other varieties of epithelioma.

seborrhea, and rhinoscleroma. Lupus develops in most cases before the age at which we find epithelioma; there is no induration, the lesions are multiple, the discharge is more purulent, and not sanious or offensive, and the apple-jelly nodules are usually to be seen around the edges of the affected parts.

Syphilitic tubercles and ulcerative processes are to be differentiated from cancer by the history of the case, the absence of pain, and the more rapid evolution of the lesions. Syphilitic tubercles are grouped, and ulceration will begin at several points, the ulcers being punched out and secreting an abundant, yellowish pus. The border of the syphilitic ulcer is not indurated as in epithelioma.

It is sometimes difficult, when a wart has been irritated, to say whether it has become epitheliomatous, but a safe rule is to treat the condition just as if it were malignant.

In the early stage of epithelioma, before ulceration has occurred, it is possible to confound it with seborrhea. In seborrhea the skin is not infiltrated, and the crusts are composed of dried sebum and epithelial scales, which, when removed, exhibit distended sebaceous follicles. The localized hypertrophy of the skin called keratosis senilis is sometimes very difficult to distinguish from epithelioma. The principal point of difference between keratosis and epithelioma is that epithelioma is usually single, while keratosis is often found in more than one place; as keratosis senilis is not infrequently the starting point for epithelioma, it is of the greatest importance to watch all cases of this affection with care.

Rhinoscleroma occurs most often on the upper lip and about the nares—a site very rare for epithelioma. Rhinoscleroma does not ulcerate, but this forms a comparatively early step in the evolution of epithelioma. Finally, a microscopic examination might reveal the bacilli of rhinoscleroma.

Prognosis.—In its ultimate outcome, epithelioma must always be looked upon as a grave disorder, although the superficial and circumscribed forms, if treated early and

radically, may not return. Even in more serious cases efficient treatment may do much to stay its progress. It must also be remembered that the march of the disease is often very slow, sometimes occupying years; but, again, the onset may be much more rapid, especially in the deep-seated varieties of skin cancer.

Treatment.—No internal treatment has as yet been discovered which will arrest the progress of cancer. A. R. Robinson, however, considers thyroid extract a valuable agent in cases of single or multiple cancers of a superficial character in elderly persons, and in all persons with a marked senile condition of the skin. He is emphatic in his belief that it prevents new growths and also aids in the removal of those already in existence. It is also proper to add that some few authorities regard arsenic favorably, although our experience does not support this view. In the later stages of the disease supporting measures, together with anodynes to relieve pain, must be used.

The curative treatment of epithelioma is wholly local. The object to be attained is the complete destruction of all cancerous tissues. That method which accomplishes this result most surely, with the least pain and inconvenience to the patient, and with the minimum of subsequent deformity, is to be chosen; but it is always to be borne in mind that no considerations of a cosmetic sort can ever excuse the surgeon from making the destruction thorough.

Removal by the **knife** has the advantages that it is exact, that it is less painful than most other methods, and that the removal can be accomplished at one operation. In regions where sufficient tissue can be spared to ensure an incision wide of the diseased area, it is the ideal method. But excision has certain drawbacks. It is a matter of guesswork how far outside the apparently involved area the incision must extend, as we have no means of determining the distance to which single cancer cells or groups of cells have penetrated into the surrounding tissues. If any of these cells be left, recurrence is very likely to take place, especially if primary union of the wound occur, for by this method

of healing any advantage to be derived from the influence of inflammatory action on the remaining cancer cells is lost. For this reason many recommend that after removal of an epithelioma the wound be cauterized and left to heal by granulation. It is a further disadvantage of the knife, that by its use no selective action is exercised, and the healthy tissue inside the lines of the incision is removed along with the diseased. The resulting deformity is thus greater than by some other methods, and in certain regions, such as the nose or the eyelid, this is a matter of no small importance.

Although the **curette** has been strongly recommended, its use is very limited. If with the knife the removal of all the new growth is a matter of great difficulty, it may be said to be almost impossible with the curette. The curette should be used to prepare the way for other treatment, as by removing the softer or necrotic portions of a growth, so that a caustic or other remedy may act more rapidly and thoroughly.

Caustics have long been employed in the treatment of cancerous growths. It is unfortunate that they constitute the principal means of treatment employed by charlatans, since on this account they have been somewhat neglected by physicians. Many chemical preparations have been used for the purpose of producing destruction by cauterization, among which may be mentioned arsenic, caustic potash, to the advantages of which, in superficial cases, Van Harlingen has again recently called attention; chloride of zinc, the stronger mineral acids, trichloroacetic acid, carbolic acid, acid nitrate of mercury (a special favorite with us), ethylate of soda, lactic acid, and pyrogallol acid. Nitrate of silver is only mentioned to be condemned as inefficient. The use of a caustic agent has the advantage that the area of action is not limited to the line of application, as is the case when the knife is used. The inflammatory reaction influences the tissues to a greater or less distance around the area to which it is actually applied.

Thus with a properly selected caustic we can accomplish

destruction of the diseased tissue with small loss of the unaffected portions. Robinson¹ believes that during the action of a caustic a toxalbumin is formed which acts in an unfavorable manner upon the cause of cancer. He supports this opinion by a reference to the decrease in size of glands at a distance from the growth, which were presumably the seat of secondary infection, which he has observed after the use of a caustic. Some caustic agents, such as arsenic and pyrogallic acid, have a selective affinity for cancerous tissue, destroying it, while the normal parts are left comparatively unaffected. The caustics which are most valuable are arsenious acid, chloride of zine, and caustic potash.

Arsenic is used in the form of a paste made by rubbing together equal parts of acacia and arsenious acid and adding enough water to make the mass of the consistency of butter. The paste should be freshly prepared each time it is used. Walker suggests the following formula:

R—Acidi arseniosi,	
Acaciæ pulv.	aa 3ij
Orthoform	3ss—M.

It should be spread on a piece of cloth large enough to extend beyond the elevated margin of the tumor. This may be held in place in contact with the tumor by means of strips of adhesive plaster. Marsden originally recommended that a space not larger than one square inch should be attacked at a time, but Robinson has applied the paste to a much larger surface and has not observed any injurious effects. Arsenic is not a suitable remedy about the lips and mucous membranes on account of the danger of absorption. The application of the paste is usually accompanied by considerable pain. The remedy should be allowed to act continuously for from fourteen to twenty hours. If the pain is not too great and the evidences of inflammatory reaction not severe, the use of the paste should be continued the full limit of time, as it has been

¹ International Journal of Surgery, July, 1892.

found that it takes arsenic longer than this to destroy the normal skin. If upon removal of the drug all the cancer mass seems to be necrosed, and there is considerable inflammation extending around it, the action may be regarded as sufficient. If such a result is not secured, the caustic must be reapplied until the desired effect is obtained.

After sufficient poulticing to remove the eschar the resulting wound should be dressed with a soothing salve. If it heal promptly from all sides, the treatment may be considered successful, but if at any portion the healing be slow, or if unhealthy granulations spring up, the paste must be again applied to that portion.

Chloride of zinc may be used in the stick form, in solution, or as a paste. The use of this caustic is attended with more pain than follows the application of arsenic. In the stick form chloride of zinc is especially suitable for cauterizing epitheliomata at the inner canthus or on the lids, as its action is easily controlled. In solutions of the strength of 50 per cent. or less, it is of great service in cauterizing wounds after excision of a growth. As a paste, zinc chloride is one of the most reliable agents for the destruction of epitheliomata. Bourgard's formula for the paste is:

R—Farinæ tritici,			
Amyli	. . . . .	āā	3j
Acidi arseniosi	. . . . .		gr. viij
Hydrarg. sulph. rub.	. . . . .		gr. xl
Ammonii muriat.	. . . . .		gr. xl
Hydrarg. bichloridi	. . . . .		gr. iv
Zinci chloridi cryst.	. . . . .		3j
Aquæ bullientis	. . . . .		3jss—M.

All the ingredients except the zinc and water are finely ground together. The zinc is then dissolved in the water, and this is poured upon the powder, stirring all the time. The paste after standing twenty-four hours is ready for use.

The paste is to be spread on cotton or linen cloth and applied to the epithelioma for twenty-four hours. If all the growth does not seem to be destroyed at the end of this time, the paste is to be reapplied. On account of the

severe pain caused by the chloride of zinc it is well to add cocaine to the paste. The treatment of the resulting wound is the same as after the use of arsenic. Czerny and Trunecek highly recommend a mixture of arsenious acid with alcohol and water in the following proportions: Powdered arsenious acid, 1 gm.; ethylic alcohol and distilled water, of each 75 gm. The growth is carefully cleaned, and if a few drops of blood appear, so much the better; the arsenical mixture is then shaken and applied all over the ulcer with a brush. A little pain, lasting a few hours, usually follows. The next day the ulceration is seen to be covered by a crust, but the application is made daily over the scab, causing it to turn from yellow to brown and at last to become almost black in color. The same treatment is continued regularly until the crust becomes readily detached, or until it is held in place by a few, thin, fibrous bands that may be cut through and the scab removed. When the first crust comes away the ulcer is again painted with the same solution. If only a thin, yellowish pellicle results it may be assumed that all of the cancerous tissue has been removed; but if a thick, adherent crust forms, the treatment must be continued. The thicker the crust the more energetic must be the application, even to the extent of employing a 1 to 100 and even a 1 to 80 solution.

French authors formerly recommended dusting the surface of the sore with potassium chlorate in powder, or applying a 5 per cent. solution. Bergeron and Vidal revived the method in modified form. Believing that the agent acts only on raw tissue, they packed the surface with the chlorate after curetting. As the attendant pain is considerable, the application is preceded by the use of cocaine.

Caustic potash, in the stick form, is the caustic most highly prized by many authors. The advantage of the remedy is that it acts rapidly, so that considerable destruction is quickly produced. Its application is quite painful. Caustic potash has no selective action, destroying both normal and diseased tissues with equal facility. When it is important to save tissue it should not be used. On ac-

count of the difficulty of limiting the action of this caustic it should not be employed about the eye or in the vicinity of large vessels or other important structures.

Pyrogallic acid has had many warm advocates. Its action is slow and painless. It may be used in the form of an ointment:

R—Acidi pyrogallici	3ij
Emplast. plumbi	3j
Cerati resinæ co.	3v—M.

This is spread on cloth and kept constantly applied for from a day to a week according to the destruction necessary. The acid has a selective action, attacking the healthy tissues only at their surface. It is a good remedy with which to follow the use of the curette.

The remedies mentioned constitute the most valuable of the caustics. Most of the others are not sufficiently destructive in their action, and are dangerous because they often serve rather as stimulants than as caustic agents.

Electricity may be used in the treatment of epithelioma, either as the galvanocautery or as the electrolytic needle. The galvanocautery destroys the part to which it is applied, and has no advantages over the knife except that there is a slight amount of inflammatory reaction following its use, and that the operation is bloodless. The electrolytic needle affords a valuable method of treatment when a small epithelioma is to be destroyed, especially about the eyelid or other part, where the destructive method used must be wholly within the control of the operator. The apparatus employed is that described under *Nævus Vascularis*. A rather stout needle is used, and this is thrust under the infiltrated base of the tumor, entering in healthy skin on one side and coming out through healthy skin on the other. The needle is thus passed from all sides until a complete destruction of the growth is secured. The necrosed mass may be left to separate by itself, or it may be at once scraped away and the raw surface touched with chromic acid that has been fused on the point of a probe. This is the procedure advised by Jamieson after curetting, a plan that we can highly recommend.

After the wound has had time to get rid of the slough it should be carefully inspected, and if any suspicious portions are seen these must be destroyed. It has seemed to us that the action of electrolysis is not confined to the tissues actually destroyed, but extends to parts apparently not injured, causing here perhaps the death of the specific cells, which are more readily injured than their normal neighbors.

While the **trypsin** treatment introduced by Beard, of Edinburgh, has not so far yielded the results confidently predicted by its author, yet a few reliable observers have reported cures so remarkable as to justify further trial. For an exposition of the startling but fascinating embryological theories which suggested the method, the curious reader may turn to the London *Lancet* for 1902-'03 and 1904. *Si non e vero, e ben trovato*. The points in Beard's contention bearing on malignancy are chiefly these: That carcinoma and sarcoma arise from the development of aberrant germinative cells—not *a la* Cohnheim, of the embryo, but of the **trophoblast**, from a minute portion of which the embryo arose. Your cancer is, therefore, your included twin brother. That the intracellular digestive processes of a malignant growth are in kind the same as those of the trophoblast, that is, due to pepsin, or, what is the same thing, "malignin," in an acid medium, and not, as in somatic tissues, trypsin and an alkaline medium. That the cure of cancer or of sarcoma, therefore, consists in substituting tryptic for peptic intracellular digestion. Trypsin is, therefore, to be given in every possible way. Messrs. Fairchild Bros. & Foster furnish the agent in the various forms required, "injectio trypsinii" for hypodermic use; "holadin," containing the three pancreatic enzymes, for administration by the mouth, and "lotio pancreaticum," for local application diluted with 3 parts of sterile water.

Shaw-McKenzie, in his book on *The Treatment of Cancer*, devotes considerable space to the treatment by injections of a solution of soap. The solution used contains

8 or 10 per cent. of soap in water. He is not clear as to the particular soap used, a superfatted soap being preferable. Subcutaneous injections are made in the region of the growth (sometimes underneath it), beginning with 5 minims and progressing to 1 drachm. The injection is somewhat painful. He claims a very favorable result, the discharge, odor, and pain being in his cases almost invariably abolished and in a good number complete disappearance of or marked diminution in the lesion being obtained. He employs, internally, in conjunction, a preparation of ox-bile, which he pushes to the limit of tolerance.

Webb, of Australia, quoted in his book, has obtained similar results.

Cataphoresis.—L. Jones (*British Medical Gazette*, February 16, 1907) describes a method by which he has obtained cures of rodent ulcers within two or three weeks after a single application. To the positive pole of a galvanic battery he connects a zinc rod surrounded by several layers of lint moistened in a solution of zinc sulphate. This is applied to the ulcer while the negative electrode is applied to any other part. 5 to 10 ma. are used for three minutes.

J. Hall Edwards uses zinc or zinc-mercury electrodes and considers it one of the best methods of rendering the ulcer aseptic.

The X-rays.—To America belongs the chief praise for the introduction and development of the x-rays in the treatment of cancer, for although the first cure was recorded by Stenbeck, of Stockholm, the method came into extended use here before being taken up by our European confrères. It is today everywhere recognized as the method of election in certain cases. What cases are these?

Choice of Cases.—The little pearl-button epitheliomatous nodule can be removed by the rays, but at a useless expenditure of time. We possess much more rapid and simpler methods, such as electrolysis, or the galvanic or other cautery, preceded or not by curettage.

The lesion of all others which gives the most brilliant results with the rays, and in the treatment of which they

have won their most brilliant triumphs, is the "rodent ulcer." In dealing with these growths one may feel almost sure of success, but even here absolute certainty is unjustifiable. One of us failed after the most thorough and persistent trial in such a case, which differed nowise clinically from others which rapidly proceeded to a cure. We believe that certain differences exist in these cases, discoverable only by their refusal to respond to treatment. We can endorse Whitfield's observation, that the rays usually fail where bone has been eroded. Actively spreading cases, in which the ulcerating edge is at most points sharply cut out in the apparently healthy skin, with only here and there broken arcs of dyke-like border, do not so often yield good results as do the more sluggish cases. Many of these cases, however, eventually heal. Others do well for a time and then break down and spread more rapidly than before. It sometimes happens that the ulcer closes over all but one little depressed area, which remains obstinate for a time, and then becomes the centre of a new and rapid destruction.

Papillary epitheliomata rarely do as well as the flatter neoplasms. Of 2 such treated by one of us, clinically similar, 1 yielded a lasting good result, while the other continued to grow in spite of active raying and was finally removed by the knife.

It is a safe rule to proceed surgically against cancers which project much above the general surface, and to commence raying the site a few days later without waiting for the wound to close over.

Large, fungating growths, and the deep, infiltrating kind, should only be treated by radiotherapy as a last resort. Lesions about mucocutaneous orifices should be treated by the rays whenever practicable, as this method affords the best cicatrices. Epithelioma of the lip is generally refractory, although one such case gave us an excellent result with no recurrence for now five years.

In conclusion, it may be said that the use of the rays to the exclusion of surgical methods is justifiable in two

groups of cases, namely, relatively mild forms at one extreme, and inoperable cases at the other.

Raying after ablation to ensure against possible recurrence is always proper, although not always necessary in the case of quasimalignant types when the surgical part of the work has been thoroughly done.

Technique.—A brisk curetting without attempting to remove all the ramifications of the growth, as advised by Stelwagon and Belot, is probably to be recommended as a time-saving measure in all sclerosed lesions.

As to quality and intensity of rays, anticathode distance, duration, and intervals of sittings, etc., the widest differences of technique have yielded good results, although some methods are far speedier than others, and again the best methods have at times failed. Every operator after a time develops a technique of his own, his degree of success being probably less dependent upon easily stated constants than upon close watchfulness, unremitting caution, and that quick recognition of faint indications which comes with long familiarity. Nevertheless, a knowledge of the formulas employed by the acknowledged masters of the art is of the highest utility.

Pusey gives "exposures of from five to fifteen minutes' duration with the wall of the tube at a distance of two to six inches from the lesion." These exposures he repeats "from two to six times weekly." He uses a relatively small amount of the rays—just enough to cause a yellowish-green glow in the tube.

Stelwagon gives five-minute exposures at 10 to 12 inches twice a week for the first fortnight. If this produces neither reaction nor amelioration, he gives three exposures a week for ten minutes at 8 inches. If there be still no response, the time is gradually increased to fifteen or twenty minutes, and the distance decreased to 5 inches. Treatment is suspended on the appearance of reaction. This is virtually the plan we have hitherto followed. According to him "it is not a good plan to use a tube of the same degree of vacuum throughout; otherwise some possible deeper-

lying morbid tissue may escape its favorable action." He begins the *seance* with a vacuum equal to a $\frac{1}{2}$ -inch spark, and then does away with the regulator, allowing the vacuum to rise slightly.

Béclère obtained a cure in a large vegetating epithelioma of ten years' duration, in the temporomaxillary region in a man of seventy, in thirteen sittings, 4 to 5 H. at a sitting, with rays of medium penetration. Three sittings were given the first week, nine at intervals of a week, and one, two and one-half weeks later.

Belot formulates the following rules:

1. To cause absorption, in one or two *seances*, of the largest dose compatible with the integrity of the tissues.

2. To wait, before proceeding farther, for the phenomena of reaction to appear, and if these are violent to wait longer until they disappear.

In an ulcerated lesion with raised margins he gives 8 to 10 H. in one or two consecutive *seances*, including a healthy strip $\frac{1}{2}$ cm. in breadth, and then waits two or three weeks. A second dose of 7 or 9 H. is then given, followed by a similar interval, and a third dose of 5 or 6 H. if the state of the skin permits it.

If the lesion be not ulcerated he begins with a smaller dose, 7 to 8 H., at two to three weeks interval, or 4 to 5 H. at intervals of a week or ten days. He finds that cases that long remain refractory at the latter dose sometimes begin to heal as soon as the former dose is employed. We have all observed similar instances.

The use of massive doses at long intervals is apparently gaining in favor in Paris and Vienna, and with some Americans, although most of the latter adhere to a more tentative, but probably safer plan, and employ far smaller doses. We recommend the latter method in any event to those who are not thoroughly familiar with this agent, which is powerful for good and for ill.

Most operators employ soft tubes in malignancy at the surface, although Freund, Crocker, and Morton employ hard tubes. Sequeira still uses tubes sparking at from 4 to 5 inches.

Many of the continental Europeans seek from the first to set up a brisk dermatitis. Most Americans, however, are satisfied with a mild erythema, while a number have published cures obtained without any visible reaction, to which testimony we can add our own.

Morton suggests increasing the fluorescence of the tissues by the administration of quinine, esculin, or fluorescin.

Clinical Effects of the Rays.—Cutaneous epithelioma is rarely a painful disease. When pain exists, however, it is generally relieved, often at the first sitting. In rare instances the contrary of this obtains. In a large, spreading rodent ulcer ending fatally by exhaustion, one of us observed, on several occasions, such an increase of pain during irradiation as to force an interruption of the sitting. Burdick, Butler, Coley, Hall Edwards and Pusey have witnessed the same phenomenon. Discharge is at first sometimes increased, but soon again diminishes. Odor usually disappears. Hemorrhage, when present, is markedly lessened. In favorable cases, either with or without a preceding erythema, one notices a cleaning off and softening of the sore. The appearance of the base begins to approximate to that of granulation tissue, or, if the lesion be raised, flattening becomes apparent. Soon the growth begins to lessen in all its diameters, and, if ulcerated, to fill up from the base, until there is left a granulating surface, level with the surrounding surface, which soon skins over. A tendency to break down again in spots is of evil import, but does not always mean ultimate failure. Satellite adenopathy when present often disappears, a most significant fact, proving that glandular enlargement does not always mean involvement in the malignant process, but may be due to simple septic absorption.

Results.—Compiling returns from both European and American sources, covering a large number of cases of all forms of cutaneous epithelioma, shows about 57 per cent. of cures. The truth, however, would be represented by a higher figure, since it is certain that at least some of those reported as, "improved" and, "still under treatment,"

were ultimately cured. Limiting the investigation to reports of the last two or three years would doubtless give a still better showing, whereas the proportion of cures among the rodent-ulcer type, in the hands of skilled operators, would approximate 90 per cent. Pusey reports, of 69 cases, 58, or 84 per cent., remaining well after from one-half to two and one-half years, that is, "symptomatically cured;" 3 "practically successful." Including these with the 58 gives 88 per cent. of cures. The remaining 8 cases were improved.

We may safely assert (1) that the majority of cases are at least temporarily cured; (2) that recurrence is less frequent than after any other method; (3) that the cosmetic effect is the best obtainable, and in certain situations, such as near the natural orifices, incomparably superior to those secured in any other way.

On the other hand, recurrences are, perhaps, more frequent than was at first supposed, although some of our cases have shown no return after five years. Others relapsed after a few months.

Changes Effected in the Growth.—The cells of a malignant growth, while proliferating more actively than those of normal tissue, are inferior in vitality, and, therefore, yield more readily to the various physical, chemical, or other noxa employed in therapeutics. Their behavior toward the x -rays is no exception to this rule. The studies of Bécélère, Perthes, Beck, Pusey, and others show that the results obtained are not due to inflammatory reaction, which may, therefore, be safely avoided. The two important things observed are obliterating endarteritis and cellular necrosis. The latter of these, says Ellis, is not dependent upon the former, but they proceed simultaneously.

Pusey's findings are in part as follows: "Examination of superficial neoplastic tissues show that at the beginning of the treatment only the cells at the circumference of the diseased foci are attacked.

"Their outline becomes indistinct, and the nuclei break

up. The scattered nuclear debris is faintly stained by hematoxylin.

"The cells exhibit various stages of degeneration, and disappear gradually by a process of cytolysis, which is followed by an absorption of the debris. The small vessels, which are in close relation with the tumor, are obliterated by a process of endarteritis.

"The cure is completed by the absorption of the diseased cells, and their replacement by connective tissue, the healthy stroma being left in all its integrity."

Disadvantages of the Method.—These are: the length of time necessary for a cure, the frequent occurrence of dermatitis, the uncertainty as to the final result, the fact that a few cases are actually made worse, that recurrence has been frequently noted, and, above all, that the case may pass out of the operable stage while awaiting the action of the rays.

Some of these drawbacks are common to all methods, others are of slight importance, while the gravest are chargeable not to the method, but to its faulty application.

The Advantages of the Method, on the other hand, are many and unquestionable:

1. The proportion of cures, in properly selected cases, is as great or greater than that yielded by any other method.

2. Recurrence is rarer than by other methods, and, even when it does occur, ordinarily yields to a second course of treatment.

3. In recurrence, after ablation, the method gives better results than does surgery.

4. The resulting scar is far less disfiguring than that yielded by the knife, cautery, or escharotic pastes.

5. Reparation about the natural orifices, the nose, the ears, and eyebrows, is effected with the least retraction and deformity possible.

6. Timid patients are saved from the dread of the knife.

7. The method is painless, and usually relieves pain, when present, as well as odor.

8. The patient need not abandon his occupation during treatment.

9. Where the method fails, recourse may still be had to surgery.

Phototherapy.—This method has yielded some good results, especially, according to Finsen and Bie, in superficial and well-demarcated cases. Average cases, according to them, require about thirty exposures of one hour each. Forchhammer reports 24 cases with 11 cures. Sjögren had 10 cases and 5 cures. Morris and Dore, 27 cases with favorable results in 12. Results on the whole are far inferior to those obtained by radiotherapy.

Radium.—Cures have been reported by Exner, Scholtz, Holzknacht, Abbe, F. H. Williams, MacIntyre, Goldberg, London, Hartigan, and Mackenzie Davidson, in cases which had resisted all other treatment, including *x*-rays. The action of radium, while resembling that of the *x*-rays, is much slighter, more limited, and less certain. On the whole it has so far proved a failure.

Static Electricity.—Skinner obtained good results in superficial epithelioma, which had broken down and was making no progress, by brush discharges from the anode of the static machine, employed on alternate days with the *x*-rays.

PAGET'S DISEASE OF THE NIPPLE.

Description.—Paget's disease of the nipple has also been called malignant papillary dermatitis. The disease almost always commences on the nipple, though it may occur elsewhere. Women in the middle period of life, or beyond, are the common victims of the malady. As usually seen by the surgeon, the nipple and areola present a red, raw, granular surface, as though the epidermis had been completely removed. The edge of the affected area is sharply defined and abrupt, and if the disease has persisted for some time there is marked infiltration of the involved tissues. From the surface there is constantly exuding a clear, viscid matter. In many of the original cases reported

by Paget, deep involvement occurred in two or three years, but in other cases the malady has run a course of ten to twenty years. The subjective symptoms are tingling and burning.

The cases which Thin examined all showed a cancerous nature, but they were not in the earliest stages.

Diagnosis.—Eczema of the nipple is the disease with which this affection is most likely to be confounded, in its early stages; but afterward, when the cancerous symptoms are predominant, the diagnosis is much simplified. M'Call Anderson offers the following points: Paget's disease of the nipple occurs mainly after the grand climacteric; eczema of the nipple and areola makes its appearance earlier, particularly during lactation; and also in scabies. In Paget's disease the affected surface is of a brilliant red, and raw and granular looking after removal of crusts; in eczema the surface is not so red and raw looking, and not granular, but often punctated. In Paget's disease there is superficial induration; in eczema the tissues are soft. The edge of the eruption in Paget's disease is abrupt and often elevated; in eczema not apt to be sharply defined, and not elevated. Moreover, Liveing points out that Paget's disease is unsymmetrical. Finally, retraction of the nipple, lancinating pains, induration of the breast, and involvement of the glands put the diagnosis beyond question.

Prognosis.—The disease may exist many years without determining any deterioration of the general health, but unless removed it will ultimately prove fatal. If the breast is amputated early, the prognosis is more favorable.

Treatment.—In the earlier stages, as it is often extremely difficult to determine the true nature of Paget's disease, the affected region should be treated with soothing salves, such as would be used in eczema. Under no circumstances should irritants or mild caustics be used, since they simply aggravate the condition. As soon as the true nature of the malady is made out, the breast should be entirely removed.

Three cures so far have been reported, but most observers have failed, in the *x*-ray treatment of this disease. A case treated for some months by one of us improved for a time, but signs of deeper involvement later caused him to desist. Hartzell, employing this agent, achieved success in one case after two years' treatment. He believes that it will cure when ducts and glands are intact.

FRAMBESIA.

Description.—Frambesia, or yaws, is a disease hardly ever found outside the tropics. The malady usually attacks the negro race, whites being generally exempt.

There is an incubation period followed by two or three well-defined stages. There is an initial papule or ulceration, and, after a variable period of fever and general disturbance, an eruption of minute papules makes its appearance. Some of these lesions go on to form conical papules, from which are developed the characteristic "yaws," which consist of a mass of red granulation tissue covered with a thin, acid secretion, the lesion somewhat resembling a raspberry.

The number of the lesions varies from one or two to hundreds. The so-called tertiary lesions, gumma-like infiltrations, ulcerations of the pharynx and nares, chronic periostitis, etc., are relatively rare.

Frambesia is contagious, being inoculable, flies sometimes acting as the carriers of contagion. The malady is due to a specific virus, though no microorganism has yet been proved to be the cause of the disease. Children are more frequently attacked than adults, and the disorder is rare after the thirty-fifth year.

Treatment.—The disease is rarely fatal if properly treated, and it is often noticeable that, though the lesions are severe, there is little disturbance of the general health. Tonics and a nutritious diet, in conjunction with cleanliness, are of prime importance. Sea-bathing seems to be

especially beneficial. Many authorities are in favor of the administration of mercury as a curative agent, but all agree that it is to be used with caution. The iodides have been advised, also thyroid extract and the erysipelas toxins. The various ulcers and sores which may form are to be treated by washing with antiseptic lotions and dressing with iodoform or similar preparations.

FURUNCULUS ORIENTALIS.

Description.—A chronic disease occurring in certain localities of the Orient, also known as Biskra button, Delhi boil, and Aleppo evil, etc., presents painful, ulcerating nodosities of exposed parts, leaving scars.

Itching at an exposed point is soon followed by a spot looking like a mosquito-bite, from the centre of which little bloodvessels radiate. The spot enlarges, scales off, becomes smooth and flat, and spreads by little ridges of smooth skin, which, like the central growth, pit on pressure.

At this stage, the surface is studded with yellow points apparently corresponding to the follicles. The centre of the tumor discharges and scabs over. Ulceration proceeds under the scab, which is surrounded by a red, flabby, irregular zone, presenting papules and fungoid granulations. Healing progresses from the centre out, the cicatrix being completed in a few months or a year. One attack usually confers immunity.

Diagnosis.—Oriental boil need not be looked for in this country. It resembles both syphilis and lupus.

Treatment.—Altounyan paints the surface with tincture of iodine. Fleming used early cauterization with nitric acid or potassa fusa. The Finsen light was used successfully in one case. Crocker suggests the *x*-rays.

NEUROSES.

HYPERESTHESIA.

Description.—An exalted sensibility of the skin, unattended by objective structural alterations, is of frequent occurrence in various functional or organic diseases of the nervous system. It is especially prone to occur in the hysterical state. At times it is apparently idiopathic. There are some persons in whom a cold bath produces the most violent sensations of pain and burning, even without any apparent alterations in the color of the skin.

DERMATALGIA.

Description.—The skin is at times the seat of a more or less superficial pain of a rheumatic or neuralgic character, which may be associated with marked hyperesthesia, although not always. Both the character and degree of pain vary considerably, and it may be intermittent in its attacks or constantly present. There are no visible alterations in the texture of the skin. The disorder may be general, but it is more apt to affect local regions, such as the scalp, palms, and soles, the spinal region, etc.

Dermatalgia is rarely idiopathic, but is usually associated with some internal disorder, *e. g.*, malaria, rheumatism, syphilis, or affections of the nervous system, and it is by no means infrequent with uterine affections.

Treatment.—The treatment consists, when practicable, of the removal of the cause back of the dermatalgia, that is, of the rheumatism, malaria, etc. Locally, various rubefacients, warmth, galvanism, and even blistering may be tried. Menthol in the strength of 2 drachms to 1 oz. of vaselin often affords temporary relief, and so does a chloral-camphor ointment.

ANESTHESIA.

Description.—Anesthetic conditions of the skin are mostly associated with various disorders of the nervous system, central or peripheral. Anesthesia is also a common symptom in nerve leprosy. The loss of the sense of pain in syphilitics, especially women, is well known. A favorite site of this manifestation is the back of the hand. Taylor states that this analgesia is often combined with the absence of the sense of touch and temperature. In other conditions a painful hyperesthesia may be associated with tactile anesthesia. In the state called "painful anesthesia" patients often experience sharp pain on the surface of those portions of the body that are totally void of sensation. This variety of anesthesia, according to Leloir, is observed frequently in facial zona, leprosy, Morvan's disease, and the different cutaneous trophoneuroses. This same authority points out that anesthesia is usually not present in diseases of the skin of non-nervous origin, but it is the rule to find it, more or less pronounced, in all dermatoneuroses.

Treatment.—The treatment is, for most cases, the treatment of the causative condition. The high-frequency current would, perhaps, be useful where local measures are required.

PRURITUS.¹

Description.—Pruritus is a functional affection of the skin in which the subjective sensation of itching, or some modification thereof, is the only direct symptom, any secondary changes or structural alterations that may occur being the result of traumatism.

In this sense, pruritus is an idiopathic disease and differs from the pruritus or itching that attends eczema, scabies, etc.

¹ See admirable discussion of this subject by E. B. Bronson, in Medical Record, October 18, 1890, and in Morrow's System of Dermatology, p. 725.

The symptoms experienced by persons suffering from pruritus are very various. Sometimes there is only slight itching of an intermittent character, or the distress may be almost continuous and of so furious a nature as to be uncontrollable. On the other hand, itching in the ordinary sense of the term may be absent, and the patient will complain of sensations of crawling or creeping, as if insects were present on the skin, or of burning, tingling, or some modification of these, or of all combined; in fact the condition of perverted cutaneous innervation which constitutes the disorder, will give rise to an endless variety of feelings impossible to catalogue or describe. In nearly all instances the pruritus is worse at night, and thus, tormented by day and robbed of sleep by night, the state of the sufferer is rendered pitiable to the extreme, and in aggravated cases suicide or insanity may be the final outcome. According to the degree of itching will be the effects upon the skin of the attempts to relieve it. At times the secondary changes will be marked, and the integument will exhibit scratch-marks, papules, pustules, and varying depths of pigmentation. Again, there will be little or no evidence of traumatism, the suffering often being more mental than physical. Indeed, complaint of abnormal sensations in the skin is frequently a sign of mental aberration, and every physician will recall patients with the fixed and ineradicable hallucination that they were the hosts of ants, bugs, and all manner of creeping, crawling, and biting creatures. The desire to scratch is irresistible, and patients in efforts to gratify the passion will not only use the nails until they are worn away, but will employ flesh brushes, sticks, corn-cobs, and even sand-paper. After a paroxysm of scratching the nervous exhaustion is often extreme.

Since the whole of the cutaneous surface may be more or less involved in the pruritus, and at other times the disorder is strictly confined to certain defined regions, it is customary to speak of the disease as being universal or local.

Pruritus Universalis.—It is rare for pruritus to be absolutely general; it is more apt to be limited to certain

rather extensive tracts, or in turn to invade one part after another. The general form may occur at any time of life and be dependent on a great variety of etiological factors, but most cases of this sort are to be found in the aged, in whom the affection is most severe and intractable.

Pruritus Localis.—In the local varieties of the disease certain special regions of the body may be the only parts attacked, the disorder being localized and showing no tendency to extend. In this way the itching may be present on the face, the eyelids, between the fingers, over the backs of the hands, or affecting certain fairly outlined areas. **Pruritus ani** is, perhaps, the most common of the localized forms. It is met with at all times of life, and in both sexes. The itching is generally very severe, particularly at night, and the scratching produces excoriations, artificial eczema, cicatrices, and dense infiltration. The itching sensations may be external, or extend to the mucous membrane. **Pruritus scroti** is often associated with that about the anal region, extending along the raphé of the perineum. Here, as elsewhere, all grades of itching may be present, as well as the degree of secondary change induced by the scratching. In bad cases the suffering is intense. **Pruritus vulvæ** or **pudendorum** is frequent, affecting the labia and clitoris, and producing eczema, vaginitis, great heat and swelling of the parts, and sometimes inducing nymphomania.

Pruritus Hiemalis.—This is that form of itching of the skin to which Duhring first called attention, and which is influenced in its development by atmospherical conditions. The pruritus is usually established with the first change of the weather in the autumn, and with varying degree, of intensity dependent upon the variations in the atmosphere, will persist until the warm season has begun. As in all other forms of the disease, the itching is worse at night. The pruritus is rarely, if ever, universal, being confined mostly to the inner surface of the thighs and lower limbs. Duhring says that it occurs in both sexes equally, at all ages after puberty, and is uninfluenced by the state of the general health. Once established, the affection is apt to recur

every winter. We have patients under our care in whom the pruritus has thus reappeared at the first spell of cold weather for many years. On the other hand, for some unknown reason, this susceptibility may diminish or may altogether disappear.

Stelwagon has described a form of itching which he calls **bath pruritus**. In these cases various degrees of burning and itching immediately follows bathing. In our experience it is relatively common.

In order to treat pruritus successfully its **etiology** must be well understood. Pruritus in the aged is usually due to senile degeneration of the skin. Among the causes of pruritus, as commonly encountered, may be mentioned functional and organic diseases of the liver, dyspepsia, Bright's disease, constipation, etc. Certain drugs and articles of diet also induce pruritus; among the former opium and its preparations are to be especially mentioned, and among the latter oatmeal and the inordinate drinking of tea.

A long list of sexual derangements may also be referred to, and the pruritus of pregnancy is a matter of common observation. Various disorders of the nervous system are complicated by itching of the skin, and the influence of abnormal mental states is well recognized.

Pruritus ani in many cases is associated with hemorrhoids, and in children the same difficulty, as well as vaginal pruritus, is due to the presence of intestinal worms. Pruritus vulvæ is often caused by uterine disease, leucorrhea, and vaginismus, although it may be apparently idiopathic. The possibility that an intractable vaginal pruritus may be one of the earliest symptoms of uterine cancer should always be borne in mind. It is also well in persistent local pruritus to examine the urine for sugar.

Diagnosis.—It is always a matter of much importance to know whether pruritus is primary, so to speak, or whether it is secondary to certain other affections. For example, excessive itching of the skin is associated with eczema, scabies, pediculosis, urticaria, and a number of

other disorders; but, all of these exhibit well-marked symptoms, whereas in pruritus, aside from alterations in the skin due to scratching, the itching is the only direct manifestation of the disorder. In pediculosis, the character of the scratch marks, their location about the neck and loins; in scabies, the furrows, the multiform lesions, and their characteristic preference for the sides of the fingers, buttocks, genitals, and breasts of women; in eczema, the preëxisting eruption; and in urticaria, the evanescent wheals should all be considered in establishing diagnosis.

In the local forms of pruritus it is necessary to ascertain the causes of the itching, whether hemorrhoids, worms, pediculi, etc.; in fact, in all forms of the disease the general is more important than the local diagnosis.

Prognosis.—It may be said that generalized pruritus admits of a better prognosis than the local forms; however, senile pruritus and the pruritus dependent upon incurable organic diseases offer notable exceptions to this rule. All the local varieties of the disorder are more or less intractable, and the physician should be guarded in the expression of his opinion as to their curability. Putting aside, however, cases obviously the result of irremovable causes, *e. g.*, genital pruritus due to pelvic tumors, general pruritus from cancer of the liver, etc., it will be found that a satisfactory outcome may often be obtained if the patient is willing to follow implicitly the instructions given him.

Treatment.—The general treatment of pruritus consists, for the most part, in the use of measures for the cure or relief of exciting or complicating disorders. In this way every part of the system should be interrogated, and pains should be taken to correct any organic or functional disorder that may be present. Particular attention should be directed to the state of the stomach, bowels, kidneys, and liver. The existence of a pre-icteric pruritus emphasizes the necessity for attention to the condition of the liver and biliary passages. The diet is often at fault, or sometimes it will be found that certain articles, like oatmeal or tea, are responsible for the itching. Tobacco undoubtedly keeps

up and aggravates anal pruritus. There are several remedies that, given **internally**, have some reputation as antipruritics. Among those may be mentioned carbolic acid (1 or 2 minims three times a day), wine of antimony (5 to 7 drops after meals), tincture of cannabis indica (10 minims gradually increased to 30, three times a day), quinine (10 gr. at bedtime), tincture of gelsemium (10 minims every half-hour until 1 drachm has been given or toxic effects are experienced), and pilocarpine ($\frac{1}{8}$ gr. hypodermically). Salicylate of sodium and salicylate of strontium often act well. Valerianate of ammonium, the bromides, chloral, and other hypnotics are useful at times. De Wannemacker has given salophen in doses of 60 to 75 gr. a day with encouraging results. Savill advises calcium chloride both in primary and secondary forms of pruritus. It may be given well diluted in 20, 30 or even 40-gr. doses, three times a day. The diet should be regulated, the bowels kept open, and the remedy persevered with for several weeks after a cure has been effected.

The **local treatment** of pruritus comprises a vast array of remedies. For general pruritus may be employed baths, electricity, lotions, and ointments.

A warm bath composed of 8 oz. of bicarbonate of sodium, to which has been added bran liquor made by infusing several pounds of bran, is soothing and agreeable. After the skin has been gently dried, it may be anointed with carbolated vaselin, 5 to 10 minims to 1 oz. Mercurial and sulphur baths may also be tried. At the Hôpital Saint-Louis, Paris, pruritus senilis is treated by hot starch baths at night, followed by sponging with a mixture of 1 part of carbolic acid to 50 parts of aromatic vinegar, stirred into a bowl of hot water. Afterward a powder of 1 part of salicylate of bismuth (or salicylic acid) to 9 parts of starch is gently rubbed in with the hand.

We have made much use of electricity in its various modes of application, namely, galvanism, general faradization, etc., without much more than temporary results; however, the mental effect is good, a fact which explains a

good part of electrical therapeutics. It is but just to add, however, that Polotebnoff claims good results with brush or pad electrodes (faradization). Others praise static insulation and static applications to the spine.

Powders of many sorts have been recommended.

Anderson's antipruritic powder is well known:

R—Pulv. amyli	3vj
Zinci oxidi	3jss
Pulv. camphoræ	3ss—M.

Leloir gives a list of powders that he has found useful:

R—Acidi salicylici	gr. xv
Zinci oxidi	3j
Pulv. amyli	3ij—M.

R—Boracis	3ss
Talci	3ijss
Zinci oxidi	3j
Amyli oryzæ	3ij—M.

Lotions of various kinds are much recommended, composed of carbolic acid, thymol, liq. carbonis detergens, liq. picis alkalinus, benzoic acid, etc.

Carbolic acid is probably the most valuable of all the remedies used in pruritus, and employed in the form of a spray, with a hand-ball atomizer, after the manner originally suggested by one of us,¹ its efficacy is considerably increased, besides being more cleanly and more conveniently applied. We generally prescribe the following lotion:

R—Acidi carbolici	5iij-5iv
Glycerini	3j
Aquæ	q. s. ad Oj—M.

S.—Use as a spray.

To increase the antipruritic effect it is a good plan to add 5 to 10 minims of the oil of peppermint to each atomizerful of the lotion. This must be well shaken just before being used. In cold weather the atomizer may be

¹ Hardaway, Journal of Cutaneous and Venereal Diseases, April, 1885.

placed in a vessel of hot water. Any substance that is "sprayable" may be thus utilized, such as liq. carbonis detergens, etc. The spray may be used as often as desired.

Among other valuable lotions may be mentioned the following:

R̄—Fol. belladonnæ,
 Fol. hyoscyami ss 3ij
 Fol. aconiti 3ss
 Acidi acetici 3j—M.
 S.—To be diluted with water, 1 drachm to 1 oz. Taylor.

R̄—Thymolis 3ij
 Liq. potassæ 3j
 Glycerini 3iij
 Aquæ 3vij—M.
 S.—Local use. Crocker.

R̄—Acidi carbolicī 3ij
 Potass. causticæ 3j
 Aquæ 3iv—M.
 S.—Local use. To be diluted if too irritating. Bulkley.

R̄—Mentholis gr. ij-x
 Aquæ 3j—M.
 S.—Local use.

R̄—Boracis 3ij
 Glycerini 3j
 Spt. camphoræ 3ss
 Aquæ rosæ 3vjss—M.
 S.—Local use. Duhring.

R̄—Liq. carbonis detergentis 3j
 Zinci oxidi 3ss
 Pulv. calaminæ præp. ʒiv
 Glycerini 3j
 Liq. calcis 3vij—M.
 S.—Shake. Apply freely.

This is a very satisfactory combination in many cases. Carbolic acid may be substituted for the tar preparation in the same proportion. Menthol, combined in the following way, will be successful in many cases:

R—Mentholis	℥ij
Alcoholis	q. s.
Acidi carbolici	℥xx
Lotionis zinci oxidi comp.	℥iv—M.

Bronson's lotion is very valuable:

R—Acidi carbolici	℥j-℥ij
Liq. potassæ	℥j
Olei lini	℥j—M.

A number of years ago one of us¹ called attention to the value of the local application of cider vinegar, followed by citrine ointment—a plan of treatment quoted by Watson in his classical work.

Bowling advises that the parts be sponged twice a day with the vinegar, and that the citrine ointment should be smeared over the surface after the former has dried. Too large a region should not be subjected to this treatment at one time.

Ointments of sulphur, tar, or of the two combined (1 drachm of each to 1 oz.) are valuable. Bulkley's chloral and camphor salve is also of service:

R—Chloralis,	
Camphoræ	℥ss-℥j
Ung. aq. rosæ	℥j—M.
S.—Local use.	

The use of a hot bath with green soap, followed by sulphur salve inunctions, is sometimes efficient, even where there is no suspicion of scabies in the case. Ointments, as a rule, are of more benefit in local forms of pruritus.

Good results are often obtained from menthol in salve form:

R—Mentholis	℥ij
Olei amygdalæ dulcis	℥ij
Lanolini	℥vj—M.

We have faithfully tried bromokoll in 10 per cent. and 20 per cent. salves and pastes, but we have by no means succeeded in getting the benefit claimed for it by German writers.

¹ Hardaway, St. Louis Clinical Record, December, 1874.

The best prescription for the sufferer from **winter itch** is a sojourn in the South during the cold weather. We have relieved at least one obstinate case by directing that heavy woolen drawers be worn over nainsook, although change in the underclothing usually remains without much effect. The usual antipruritic salves and lotions may be tried as in pruritus generally. Menthol and carbolic acid used in connection with the compound zinc lotion generally give temporary relief. If the skin is naturally harsh, the menthol and carbolic acid may be prescribed in a soft ointment, or salicylic acid may be ordered in the strength of 10 gr. to 1 oz. in a salve compound of equal parts of lanolin, vaselin, and benzoated lard (Stelwagon). It is a fact that with many persons this peculiar susceptibility disappears in the course of time.

In our experience, but little can be accomplished in the treatment of **bath pruritus**. Occasionally persons who cannot take a cold bath without suffering experience but little discomfort when hot water is used, and others can indulge in a Turkish bath with impunity. Stelwagon recommends salt baths in some cases, and in others alkaline baths, and following the bath the application to the skin of a bland dusting powder, or, if that is ineffectual, the inunction of some soft, creamy salve or a glycerin lotion. A small quantity of carbolic acid or thymol may be added. This same authority advises proper constitutional measures if required, and states that in lithemic subjects small doses of salicylate of sodium are of value. Arsenic has also been suggested.

In the treatment of the strictly local forms of pruritus it is also necessary to seek diligently for the exciting or complicating causes of the disorder, and, if possible, remove them. The local remedies are very numerous, but, in addition to those already mentioned, we shall give only such as have proved useful in our own hands, or are recommended by competent authorities.

Pruritus Scroti.—In most cases a well-fitting suspensory bandage is of decided benefit. Sometimes, when the

pruritus is accompanied by considerable sweating, a dusting powder of thymol and oleate of zinc (℞—Thymol., gr. j; pulv. zinci oleatis, ℥j—M.) is demanded. Bulkley's method with tar salve and hot water (see Eczema of the Scrotum) often does equally good service in pruritus of this region. The same author's camphor and chloral mixture may also be tried. The mercurial preparations are to be highly recommended, especially the white precipitate (℞—Hydrargyri ammoniati, gr. xx; adipis benzoati, ℥j—M.). Calomel in the strength of $\frac{1}{2}$ to 1 drachm to 1 oz. may be prescribed in place of the ammoniated mercury. The vinegar applications followed by citrine ointment are often curative. The yellow and black washes are occasionally prescribed. Liveing's perchloride of mercury lotion (℞—Hydrargyri bichloridi, gr. ij-iv; acidi hydrocyanici diluti, ℥j; emuls. amygdalæ, ℥viiij—M.) may be employed when the skin is unbroken. Carbolic acid lotions and ointments are as valuable here as elsewhere. Pencillings with the nitrate of silver solution (℞—Argenti nitratis, gr. xvj; spiritus ætheris nitrosi, ℥j—M.) are sometimes surprisingly beneficial. In intractable cases Vidal makes multiple scarifications with the scarificator of B. Squire.

Pruritus Ani.—Carbolic acid, 15 to 40 gr. to 1 oz. of oil of sweet almonds, is highly spoken of by Duhring. Menthol may be added to the carbolic acid in this prescription, or the carbolic acid and menthol may be prescribed in the form of a paste. (See additional prescriptions.)

The various tar and mercurial preparations, and particularly the latter, at one time or another give relief. A bismuth and morphine salve (℞—Bismuthi nitratis, ℥j; morphinæ hydrochloratis, gr. ij; ung. aquæ rosæ, ℥j—M.) is said by Liveing to be especially valuable. Balsam of Peru of the strength of $1\frac{1}{2}$ drachms to 1 oz. of simple ointment is occasionally helpful. The compound gall ointment of the pharmacopœia has been much employed, and is especially useful if hemorrhoids are present. Lassar's paste (see Eczema), kept thinly smeared over the parts night and day, is an excellent remedy. Suppositories of

cocaine or belladonna give temporary relief. Pencilling the part with the nitrate of silver solution mentioned above is to be recommended, particularly when cracks and fissures exist. The hot water and tar treatment already referred to gives, perhaps, more immediate relief than any other method at our command.

Seat-worms will occasionally be found in adults, and oftener in children, and are best dealt with by enemata of infusion of quassia chips. Brocq has succeeded with Vidal's method of multiple scarification in vulvar and anal cases after all else had failed.

Recourse to radiotherapy would only be justifiable in cases that have resisted other treatment. Soft rays should be used in mild doses at long intervals.

We can add our testimony as to its value in anal and vulvar pruritus to that of Pusey.

High-frequency currents are often very efficient in general pruritus.

Pruritus Vulvæ.—The first thing to do for the relief of this condition is to seek for its cause and, if possible, remove it. The causes have been found, in our experience, in about the following order of frequency: (1) neuropathy; (2) leucorrhœa; (3) glycosuria; (4) seat-worms (the latter more often in children, although one of our cases was found in the wife of a physician).

When the parts are hot and swollen from excessive scratching, great relief may be obtained by the use of very hot water followed by tar ointment and cold cream (R—Ung. picis liq., ℥ij; ung. aq. rosæ, ℥vj—M.) or the ung. vaselini plumbicum spread on lint. A 10 per cent. solution of cocaine will give temporary relief. Schwimmer recommends an ointment of alumina (R—Alumin. hydrat., ℥jss; glycerini, olei olivæ, āā ℥v; ung. mollis, ℥x—M.). Goodell relies on an infusion of tobacco, of the strength of 2 drachms of the leaf to 1 pint.

Saturated solution of boric acid is thought well of by some physicians. Reeve directs that the parts be painted every night with the compound tincture of benzoin (B. P.).

Robinson says that an ethereal solution of iodoform in spray, or an iodoform ointment, is occasionally useful. The solution of silver in nitrous ether (16 gr. to 1 oz.) often does well. The carbolic acid spray, with oil of peppermint, referred to above, may also be advised. Routh recommends that 1 teaspoonful of borax be put in 1 pint bottle of hot water, to which is added 5 drops of oil of peppermint, with which, after thorough shaking, the parts are to be freely mopped with a soft sponge.

Conium ointment as recommended by Whitla (*vide infra*) is of especial value. Hirst and Deaver advocate section of sensory nerves in incoercible cases.

In all forms of pruritus about the genital and anal regions scrupulous cleanliness is required, and when practicable the surfaces should be kept apart by the interposition of lint or absorbent cotton.

ADDITIONAL PRESCRIPTIONS.

R—Ext. hamamelis fld.	f 3j
Ext. ergotæ fld.	f 3ij
Ext. hydrastis fld.	f 3ij
Tinct. benzoini comp.	f 3ij
Ol. olivæ carbolat. (5.0 carbolic acid)	f 3j—M.

S.—1 to 2½ drachms to be injected into rectum daily. If perineal skin is infiltrated, paint on solution nitrate of silver, 96 gr. to 1 oz. When parts have become normal, apply citrine ointment for two weeks, then twice a week for several months. Adler.

R—Mentholis	gr. iij
Acidi carbolici	gr. iv
Acidi salicylici	5ss
Zinci oxidī	3jss
Liq. petrolati	3j—M.

S.—Apply locally. Brocq.

R—Resorcini	gr. xv-xxx
Sodii chloridi	gr. xv
Glycerini	3ij
Liquor. calcis	q. s. ad 3iv—M.

S.—External use. Hartzell.

R—Acidi acetici	gr. lxxv
Lanolini pur.	℥vjss
Vaselini	℥v—M.

S.—Use on the dry pruritic skin. Leistikow

R—Creosoti purif.	℥xxx
Cocainæ hydrochlor.	gr. xij
Ung. conii	℥j—M.

S.—External use in pruritus of the anus and female genital organs. Give a small *cold* water injection at bedtime, after which smear parts with hemlock ointment (plain or as above), some of it being pushed up in the vagina or rectum by the finger. Whitla.

R—Ung. picis liquidæ	℥vj
Ung. belladonnæ	℥iv
Tr. aconiti	℥j
Zinci oxidi	℥ij
Ung. aq. rosæ	℥vj—M.

S.—In pruritus of anus and vulva. To be used cautiously. Bulkley.

R—Acidi carbolici	gr. x-xx
Hydrarg. chlor. mitis	gr. xx-xxx
Ung. zinci oxidi	℥j—M.

S.—In anal pruritus. Schamberg.

R—Mentholis	gr. xlv
Olei olivæ,	
Lanolini	āā ℥j—M.

S.—For external use in senile pruritus. Eloy.

R—Acidi acetici	gr. lxxv
Misce cum:	
Terrâ siliciâ	℥ijss
Adde:	
Lanolinum pur.	℥vjss
Vaselinum	℥ijss—M.

S.—A paste for the oily pruritic skin. Leistikow.

R—Mentholis	℥j
Acidi carbolici	℥j
Ol. amygdalæ dulcis	℥j
Cerati simplicis	℥ij
Pulv. zinci oxidi	℥ij—M.

S.—Local use in pruritus of the anal region.

DISEASES OF THE APPENDAGES OF THE SKIN.

DISEASES OF THE SWEAT GLANDS.

HYPERIDROSIS.

Description.—Hyperidrosis is a functional disorder of the sweat glands in which the secretion is produced in excess. This abnormal condition may be general or partial, acute or chronic; it may but slightly exceed the natural perspiration, or, on the other hand, be given off in large amounts. The general forms are mostly symptomatic, occurring in connection with phthisis and other conditions of debility, or in the course of various febrile states.

Very fat people, and those much given to stimulants, also suffer from general sweating of the surface. Hyperidrosis affecting one side of the body or one limb may sometimes occur.

The local forms of the disease are those that especially concern the dermatologist. In most cases the affection is found upon the palms of the hands, axillæ, the inguinal region, and the soles of the feet. In these regions, as elsewhere, the amount of the secretion may be great or little. The hyperidrosis is in some cases unilateral. When the palms or soles are involved the parts may merely feel cold and clammy, or else warm and moist.

Sometimes the secretion appears in small drops, or it may drip from them as freely as if the members had been dipped into a basin of water. We believe this very free discharge is oftener seen on the palms than on the soles. Excessive sweating may give rise to intertrigo or eczema in certain situations, *e. g.*, about the genitals and between

folds of the skin. Many persons who sweat profusely about the scalp suffer later from alopecia. On the feet especially perspiration is apt to have a disgusting odor (bromidrosis), and the skin has a sodden, macerated appearance.

Persons of all ages, of both sexes, the rich and the poor, the cleanly and the dirty are subject to this affection. The **cause** or **causes** are obscure, but probably in most cases there is some fault in the nervous system. Crocker states that slight hyperidrosis of the palms may be congenital and occasionally hereditary. Buzzi believes that the excessive sweating of fat persons is due to a passive hyperemia, arising from an obstruction to the venous blood caused by the pressure of the subcutaneous fat, and not by the increased exertion necessary in stout people. Cutler regards hyperidrosis as a functional affection of the sympathetic system.¹

There is no doubt that flat-foot is often associated with hyperidrosis pedum.

Prognosis.—The prognosis should be guarded. Some cases recover more or less promptly, while others defy all treatment. Sweating of the feet would seem to be more amenable to remedies than a similar condition of the hands.

Treatment.—In all cases it is well to treat obvious deviations from health. The treatment of the night-sweats of phthisis, etc., need not be gone into here. Often enough no special indication can be determined, and then it is necessary to try the effect of the so-called specifics. Among these may be mentioned belladonna, atropia, agaricin, and ergot. In our experience their effect is only temporary at best; besides, in the case of belladonna and its alkaloid, putting the patient to considerable inconvenience. Krahn prescribes 20 drops of tincture of salvia (sage) in the morning and 20 to 40 drops at bedtime. It must be continued for several weeks. Camphoric acid is highly recommended in

¹ Journal of Cutaneous and Venereal Diseases, February, 1888.

various forms of sweating by a number of writers. Crocker says that the best remedy is a level teaspoonful of precipitated sulphur, in milk, twice a day. If it prove too laxative it may be combined as follows, and given in the same dose:

R—Pulv. cretæ comp.	3vj
Pulv. cinnamomi comp.	3ij
Sulphuris præcipitati	3j—M.

The **local applications** are numberless.

Fox recommends a 1 per cent. solution of quinine in alcohol; Crocker, a belladonna ointment or liniment; Rohé, a prescription containing 8 gr. of tannin to 4 oz. of bay rum, followed by a dusting powder consisting of starch, combined with oxide of zinc, boric acid, or salicylic acid. We have found a solution of salicylic acid in alcohol (1 drachm to 4 oz.) to do good; also a saturated solution of boric acid. The application of very hot water is temporarily beneficial.

Unna recommends for hyperidrosis capitis a superfatted formalin soap and Leistikow a solution of resorcin and salicylic acid. The following prescription is often useful:

R—Resorcini	gr. xlvijj
Acidi tannici,	
Chloral hydratis	āā 3jss
Tr. benzoini.	3ss
Ol. ricini	3ij
Alcoholis	q. s. ad 3viiij—M.

S.—Apply small quantity to the scalp with a medicine dropper.

In order to avoid excessive perspiration of the axillary region the parts should be kept as well ventilated as possible, that is to say, rubber pads and such contrivances should be avoided and scrupulous cleanliness observed. Formalin soap is useful (Unna) and the various dusting powders containing small amounts of salicylic and boric acids may be prescribed. Heusner's prescription (*vide infra*) containing balsam of Peru and formic acid is valuable.

Sweating in the femoral region may be treated on the same general plan, but pastes act very well in these parts and are especially useful in preventing intertrigo.

R—Acidi salicylici gr. x
 Talci,
 Zinci oxidi aa ʒij
 Vaselini ʒiv—M.

S.—Apply very thinly.

One grain of thymol to 1 oz. of oleate of zinc is also agreeable and beneficial.

For the local sweating of the feet no plan of treatment gives such general satisfaction as the method originally suggested by Hebra.¹ The diachylon ointment or the unguentum vaselini plumbicum is spread over a piece of linen about a foot square. The part having been first washed, and well dried, is then enveloped in this application, the toes at the same time being kept apart by pledgets of lint smeared over with the salve. Care must be taken that the foot be completely covered, and that the dressing be accurately in contact with the skin. After the completion of the operation a clean stocking is put on and over all a light, new, low shoe. In twelve hours the dressing should be removed, the foot rubbed with a dry cloth, or a dusting powder applied to it.

This procedure is gone through with twice a day for from eight to twelve days. *In the mean time the parts must not be washed.* At the end of this period the dressings may be removed permanently, and the use of the dusting powder continued for some while longer.

After a few days the thickened cuticle peels off, leaving the surface covered with a clean, white skin. When the foot has become normal it may be washed, but the dusting powder should still be rubbed in for a few weeks longer. Sometimes the cure is permanent, but in other cases a repetition of the process is required.

Thin recommends for this condition dusting the shoes and stockings with boric acid, the wearing of cork soles which have been dipped into a solution of boric acid, and a boric acid ointment. Morrow speaks well of foot

¹ Diseases of the Skin, vol. i, p. 89, Sydenham Society Transactions, 1866.

baths of *pinus canadensis*, afterward dusting with boric or salicylic acid mixed with lycopodium. Simply strapping evenly and carefully with soap or lead plaster often suffices. Noebe advises that a 10 per cent. solution nitrate of silver be painted on the sole of the foot and between the toes every day until the horny layer is shed.

Ludwig Weiss extols the value of foot baths containing 1 per cent. solution of potassium permanganate in water at a temperature of 104°.¹

We have elsewhere² called attention to the fact that sweating of the feet is a common symptom of flat-foot, and may even precede that malposition. It is always well, therefore, to look to the anatomical condition of the feet, and, where flat-foot exists, to have it remedied by suitable appliances.

Among other recent methods of treatment of hyperidrosis and bromidrosis may be mentioned the application of tannoform, which is a powder consisting of formalin and tannin. Under this treatment, according to Frank, the secretion speedily diminishes, and the smell in bromidrosis passes away. Frey recommends a 2 per cent. solution of formalin, with which the soles and interdigital spaces should be washed twice a day; the same solution may be employed to wash out the inside of the shoes. Heusner advises the following wash: Balsam Peru, 15 gr.; formic acid, 75 gr.; chloral, 75 gr.; alcohol, 1 oz. This may be applied to local areas by means of a cotton tampon, and for general sweating it may be used in a spray. In rebellious cases of local sweating the solution may be doubled and 15 gr. of trichloroacetic acid may be added to it.

We can speak very favorably of this method of treatment.

Stelwagon, Bulkley, and Engman have reported amelioration of local sweating following x-ray exposures. Pusey's experience is that "practically in all cases the results meet

¹ Journal of American Medical Association, August 6, 1904.

² Hardaway, Warty Growths, Callosities, and Hyperidrosis, and their Relation to Malposition of the Feet, Journal of Cutaneous Diseases, March, 1906.

the exacting demands of patients." He does not produce an erythema. Stelwagon has had good results from galvanism and faradism in localized forms, especially of the hands.

ADDITIONAL PRESCRIPTIONS.

R—Vasellini gr. lxxv
 Lanolini ʒijss
 Aquæ ʒiv
 Acidi salicylici gr. vijss
 Liq. formaldehyd. ℥xxxvij—M.
 S.—External use. Leredde.

R—Liq. ferri persulphatis ʒvijss
 Glycerini ʒijss
 Ol. bergamottæ ʒv—M.
 S.—Paint on soles of feet and between toes. Legoux.

R—Acidi salicylici ʒss-ʒijss
 Zinci oxidi, āā ʒj—M.
 Talci venet.
 S.—To be dusted on freely every few hours. L. Heitzmann.

R—Pulv. talcis ʒx
 Bismuthi subnit. ʒxj
 Potassii permang. ʒiij
 Sodii salicylatis ʒss—M.
 S.—Sprinkle inside the stockings in bromidrosis. Bardet.

R—Lanolini gr. lxxv
 Vasellini ʒijss
 Liq. formaldehyd. ʒss-ʒj—M.
 S.—Rub in morning and evening. If irritation occurs suspend treatment and use soothing remedies. Leistikow.

R—Acidi salicylici ʒss
 Acidi tannici ʒj
 Pulv. marantæ ʒss
 Pulv. amyli ʒss—M.
 S.—For sweating feet. Isadore Dyer.

R—Naphtholis ʒijss
 Aquæ cologniensis ʒvj
 Spt. vini gallici ʒvss—M.
 S.—Local use in hyperidrosis of palms and soles. Kaposi.

Bromidrosis, or more properly osmidrosis, is a functional disorder of the sweat glands, in which the perspired fluid exhales a disagreeable or abnormal odor. The quantity of the sweat may not be increased. Bromidrosis, or stinking sweat, is most frequently of a local character, and may have its seat in the axillæ, about the genitals, perineum, or feet. It is said by Thin to be due to a microörganism called the *Bacterium foetidum*, but in many cases no special organism can be found. A great variety of odors may be present in the sweat, fragrant or the reverse, and often connected with disorders of the nervous system.

The **treatment** of bromidrosis is considered under Hyperidrosis.

Chromidrosis is a disorder of the perspiratory glands in which the sweat assumes various shades of color, as blue, red, or yellow.

The disease is most frequently observed on the lower eyelids, forehead, cheeks, abdomen, and scrotum. Sometimes a fine, brick-dust-like deposit is seen in connection with it, or, on the other hand, it occurs as a discoloration of the skin and even of the fine hairs. Not infrequently this affection is feigned by hysterics. The causes are obscure; some cases have been thought to be due to the presence of indican; in others bacteria have been demonstrated; while in still others the result of examinations was negative.

In moist, warm parts of the body like the axillæ and the genital regions, red sweat has been observed, concomitant with the concretions on the hairs known as **lepothrix**. Blue, green, and red sweat is at times caused by the ingestion of various chemical substances.¹

The **treatment** is necessarily conducted on general principles, and consists in removing presumed causative

¹ See also Heidingsfeld, Journal of American Medical Association, December 13, 1902. A case due to some anomaly of pigmentation in which the sweat glands were healthy. Other conditions such as *uridrosis*, *phosphorescent sweat*, and *hematidrosis* may be mentioned in this connection.

conditions, such as anemia, hysteria, uterine disorders, etc. In a case observed by J. C. White an ointment of boric and salicylic acids was used with satisfactory results. Red chromidrosis due to microorganisms should be treated by the free use of soap and water and the application of boric acid and resorcin lotions. Bichloride solution, 1 to 1000, and washings with ether, chloroform, and aromatics have also been recommended.

Anidrosis, or deficiency of sweat, is often a symptom in general diseases such as diabetes and Bright's disease, and also is found as a concomitant in varying degrees in certain skin affections, *e. g.*, ichthyosis, psoriasis, general eczema, the atrophic patches of leprosy, scleroderma, morphea, etc.; also in many trophoneuroses and after injuries to nerves. The perspiratory function in certain persons seems in abeyance even under circumstances that would usually produce free sweating.

The **treatment** of this condition is, as a rule, the treatment of the disorder of which it is symptomatic. Persons having abnormally dry skins can be made more comfortable by the use of bland oils and salves. (See Ichthyosis.)

HIDRADENITIS SUPPURATIVA.

Description.—This is a suppurative inflammation of a sweat gland resulting in its destruction and the production of a scar (Pollitzer).

The lesions may be few or numerous, and the sites of predilection are the axilla, anus, nipple, scrotum, and labia majora, in which situations they are apt to occur singly, but on the face and neck, and the surface of the body, they generally appear in large numbers.

The eruption begins as deep, painless subcutaneous nodules, the overlying skin being freely movable and of normal color.

In the course of some weeks the lesion enlarges to the size of a pea, the skin covering it becomes red, and some

pain is felt on pressure. If the tumor be punctured a few drops of pus may be secured, but if it be allowed to go on undisturbed the growth will suppurate and leave a pigmented spot that ultimately remains as a slightly depressed scar. By most authorities today this affection is regarded as identical with or allied to the rather vague group of diseases known variously as *folliculitis*, *acnitis*, etc.

The **treatment** is that of *acne varioliformis*. One of us obtained a cure of one case and improvement of another by a long course of x-ray treatment.

MILIARIA.

Description.—Miliaria, lichen tropicus, or prickly heat, is an acute inflammatory disorder of the sweat glands characterized by vesicles, papules, vesicopapules, and sometimes pustules. As ordinarily encountered, the eruption is limited to the trunk, although it may exist elsewhere, and consists of minute, acuminate, bright-red papules, to which the term prickly heat is popularly applied.

Sometimes the lesions are entirely vesicular, or again, and especially on the face, pustular, or a mixture of papules, vesicopapules, and vesicles. The eruption comes out suddenly, usually coincidently with profuse sweating, and in favorable cases generally subsides with slight desquamation in two or three days. The subjective symptoms consist of most annoying, tingling, burning, and prickling sensations. Various terms are used to indicate one or another clinical feature of the affection, viz., *miliaria vesiculosa*, *miliaria papulosa*, *miliaria rubra*, *miliaria alba*, etc. The pustular form, which is not uncommon in this region, is not usually described in the books. We have seen many examples of it during our hot summers. Furunculosis is not an infrequent sequel, especially in children. Eczema may also follow.

Great heat of any sort is the exciting cause and consequently, as would be expected, the disorder is most fre-

quent in summer. Children are more subject to prickly heat than adults, and the obese are oftener attacked than the lean. It is especially prone to occur in the intemperate.

Diagnosis.—Miliaria differs from eczema papulosum in the fact that the lesions of the latter are larger, have a longer duration, and are accompanied by greater pruritus; and from eczema vesiculosum in that the eczematous vesicles are more closely set, and rupture more speedily, giving rise to a characteristic discharge. The occasional pustular form of miliaria sometimes bears more or less resemblance to smallpox and the pustular syphilide. Sudamina are not inflammatory in character.

Treatment.—As it is rarely possible to remove the immediate exciting cause, namely, the great heat, the patient should be put in as good a condition as practicable to withstand it. This may be accomplished by living on a diet that is mainly farinaceous, by abstaining from alcoholic stimulants, and by wearing suitable garments. Children especially are often cruelly swathed in flannels and other heavy clothing. In an acute, extensive eruption, in the adult, the citrate of potassium in the form of the granulated effervescent salt is agreeable and useful. Tonics are sometimes demanded in relapsing cases; in the majority, however, internal treatment is not required. Locally, the most speedy relief may be obtained from the zinc and calamine lotion:

R—Acidi carbolici ℥xx
 (vel liq. carbonis detergentis)
 Lotionis zinci et calaminæ ℥iv—M.
 S.—Mop on freely.

Anderson's dusting powder is also beneficial:

R—Pulv. amyli ℥vj
 Zinci oxidi ℥jss
 Pulv. camphoræ ℥ss—M.
 S.—Dusting powder.

SUDAMEN.

Description.—This is a non-inflammatory affection of the sweat glands in which small pin-point, or slightly larger, clear vesicles appear upon the skin. They have been compared not inaptly to dewdrops, and are usually observed upon the skin in great numbers, closely set, yet discrete, and possessing a pearly lustre. They are entirely without inflammatory hue, and are not surrounded by an areola. They do not become purulent, and the vesicle wall does not rupture, but their contents undergo absorption, and the lesion disappears with a branny desquamation. Sudamina are prone to attack the thin portions of the skin; on the face the lesions are deeper-seated and more persistent.

Sudamina are observed in connection with conditions of general debility and in febrile disorders; on the other hand, even in perfectly healthy persons, where there is excessive formation of sweat, the same disorder may be induced.

Treatment.—Removal of the exciting cause is the main indication for general treatment. Locally, the application of dusting powders of lycopodium and oxide of zinc, or of starch, are demanded.

HIDROCYSTOMA.

Description.—This condition was first described by A. R. Robinson in 1884, but more fully some years afterward. Since that time a number of cases have been published. The following description is taken from Robinson's account of the disorder:

The eruption occurs upon the lower part of the forehead, the orbital region, nose, cheeks, and often upon the upper and lower lips and the chin. The eruption has never been observed elsewhere on the body. When few lesions are present they are generally discrete; if, however, they are very numerous they may be more closely set. The indi-

vidual elements appear as tense, shiny, clear vesicles that vary in size from a pin's head to a pea, and are of a round, obtuse, or ovoid form. They are deep-seated, and the smaller lesions resemble a boiled sago grain; the larger lesions present a "darkish-blue" tint. When the contents dry up the lesions have a milium-like aspect.

The vesicle contents are clear and remain so, and unless accidentally ruptured the lesions dry up after an existence of one or more weeks. The skin of the involved area may be left in a normal state or else exhibit slight temporary pigmentation. Subjective symptoms are mostly absent, or there may be some degree of tension and smarting. Most of the patients are women in middle life who perspire easily, and who, like washerwomen, are exposed to much heat and moisture. The eruption is worse in summer than in winter. The lesions are cysts of the sweat ducts filled with sweat.

Treatment.—Avoidance of the known causes of the disease constitutes the prophylactic treatment. The actual lesions may be punctured.

GRANULOSIS RUBRA NASI.

Description.—This disorder usually occupies the end and sides of the nose, but may at times be seated on the upper lip, cheeks, and eyebrows. The involved area is of a red color, over which may be observed minute papules and macules of a deep-red or brownish-red hue, which may be made to disappear under pressure.

There is a coincident hyperidrosis of the affected region, and drops of sweat may be often observed interspersed among the other lesions. The disease runs a chronic course. Its subjects have been young children of delicate constitution.

Treatment.—The treatment is not satisfactory. Linear scarification has been suggested.

DISEASES OF THE SEBACEOUS GLANDS.

SEBORRHEA.

Description.—Seborrhea, sometimes also called steatorrhea, is a functional disease of the sebaceous glands characterized by excessive secretion of sebaceous matter, which is deposited on the skin in the form of oily, scaly, or crusted material.

Seborrhea is one of the commonest of skin affections, but since, when uncomplicated, it occasions little or no inconvenience, the disorder chiefly comes under medical observation as a part of a general condition which may include acne, loss of hair, etc. It was formerly the custom to divide seborrhea into two varieties, namely, seborrhea oleosa and seborrhea sicca, but of recent years the latter term has been dropped, since it is held that cases of the so-called dry form are inflammatory in character, and represent more properly the condition described elsewhere as seborrheal eczema. We still, however, recognize with Stelwagon and others a condition in which there is a formation of crusts and scales without inflammation, but we must admit that the "step from seborrhea to eczema seborrheicum is often a short one."

Seborrhea of the Scalp.—A certain amount of seborrhea of the scalp may persist in newborn children, and the effort to remove it by washing, combing and other harsh measures is not an infrequent cause of eczema. Unmixed seborrhea is comparatively infrequent in the adult scalp, and is said to be more apt to attack persons having black hair. In these cases the hair is shiny and greasy to the touch and often matted together. Unless scrupulous cleanliness is observed, the parts become very foul from the collection of impurities, and an accompanying dermatitis may occur as a complication.

In the crusted, scaly form we find thin, greasy, adhe-

rent scales about the openings of the hair follicles, or attached to the hair, or heaped up in greasy masses more or less firmly adherent to the scalp. The underlying skin is generally pale or even ashen in color; but at times from scratching, pruritus often being present, the scalp may be reddened, or here and there will exhibit moist spots that readily crust over. Seborrhea of the bearded face and eyebrows is also observed. In seborrhea the nutrition of the hair is interfered with, and baldness may ensue; but in our experience this result is by no means inevitable.

Seborrhea of the Face.—A general unctuous condition of the face is common with a great many persons, and an oily condition of the nose, which at the same time is of a bluish-red color to the eye and cold to the touch, is frequently seen in chlorotic and strumous young people. Very often, as a result of squeezing and pinching, the member becomes large and flabby. The region behind the ears, at the sides of the nose, and the corners of the mouth are common seats of seborrhea.

Seborrhea of the **umbilicus**, often leading to inflammatory conditions (seborrheal eczema), is comparatively frequent. A form of **general seborrhea** is sometimes seen in both children and adults.

Among the predisposing **causes** usually ascribed for the production of seborrhea are chlorosis, dyspepsia, wasting diseases, and various disturbances of nutrition. In many instances the cause is not apparent. The seborrheic condition of the skin that follows smallpox, and also that which becomes established in syphilis, are well known.

The view that seborrhea is of parasitic origin and contagious is held by some eminent authorities, but in no way interferes with the idea that a certain soil may be necessary for the growth and multiplication of the noxious organisms. Unna's belief that the sweat glands supply the fatty secretion is well known.

Prognosis.—It is not difficult to remove temporarily a seborrhea, but relapses are to be expected. The disease in infants is easy to manage, and genital seborrhea is quite amenable to treatment.

Treatment.—In all cases of seborrhea it is important to correct any derangements of the health that may be present, and to place the patient under the best hygienic conditions. To these ends the diet should be regulated, dyspepsia removed, and such other measures advised as the special necessities of the case may warrant. Iron is often indicated, and may be given in the form of Blaud's pills with *nux vomica*, or as a wine of iron with Fowler's solution. Robust persons who may be suffering from a deranged digestion and constipation are often benefited by the *mistura ferri acida* of Startin. We have not seen any result from the administration of the sulphide of calcium, but we believe that the long-continued use of sulphur in the form of Garrod's lozenges is beneficial. Elliot advises *ichthyol* internally, beginning with one 5-gr. capsule, three times a day, and gradually increasing to five or more during the same period.

The local treatment is of much importance. It is first necessary to remove all crusts and scales, particularly from the scalp. This may be accomplished where the crusts are thick and tenacious, by soaking the parts over night with olive oil under a flannel cap, and then washing freely next morning with equal parts of green soap and alcohol. At other times the simple washing with the soap spirit is sufficient. Of all the preparations that have been advised for seborrhea, sulphur gives the speediest and most satisfactory results. We usually combine a small quantity of salicylic acid with it:

R—Sulphuris præcipitati	3j- 3ij
Acidi salicylici	ʒi
Vaselini	ʒj
Olei limonis	q. s.—M.

S.—Apply a small quantity once or twice in the day.

If this or any other greasy application is used on the scalp, it will be necessary to direct the patient to employ the shampoo every four or five days or even oftener.¹

¹ When ordering the shampoo for the first time it is advisable to warn the patient that probably a great many loose hairs will come away, else the physician will be blamed for prescribing unduly strong remedies.

For seborrhea of the scalp Vidal suggests the following:

R—Sulphuris præcipitati	℥ss
Olei ricini	℥ij
Olei theobromæ	℥ij
Balsami peruviani	℥ss—M.

Mix the sulphur and castor oil thoroughly, then add the cocoa butter by aid of a gentle heat, and finally the balsam.

S.—Rub into scalp morning and evening.

Bronson's pomade is also very serviceable in the same condition:

R—Hydrarg. ammoniati	℥j
Hydrarg. chloridi mitis	℥ij
Vaselini	℥j—M.

S.—Apply once or twice daily.

Elliot particularly recommends resorcin, 3 to 12 per cent. strength, preferably in alcoholic solution.

Various mercurial preparations, tar, tannin, chloral, and carbolic acid have also been recommended.

According to Morrow, for seborrhea of the face, after the crusts have been removed, the following is an excellent application:

R—Sulphuris præcipitati,	
Spiritus odorati	āā ℥ss
Amyli mucilaginis	℥iv—M.

S.—To be applied at night, the following morning to be washed off, and the affected surfaces to be powdered with sulphur, 1 part, to fuller's earth, 7 parts.

Oily seborrhea of the nose is sometimes much improved by mopping with the zinc and sulphuret of potassium lotion:

R—Zinci sulphatis,	
Potassii sulphuratæ	āā ℥j
Sulphuris præcip.	℥j
Aquæ rosæ	℥iv—M.

S.—External use.

Mopping the part with ether will remove the oiliness temporarily. A superfatted soap containing sulphur and salicylic acid is also useful. The following lotion is agreeable.

R—Acidi borici ʒij
 Alcoholis ʒiv—M.

S.—Mop on with rag several times daily or whenever the face is “shiny.”

For seborrhea of the trunk the same remedies may be used as in other localities, the sulphur and resorcin preparations giving, however, the best results. The following formula is useful:

R—Resorcini gr. x-xx
 Zinci oxidi ʒss
 Sulphuris præcipitati ʒj
 Vaselini ʒj—M.

Seborrhea of the genitals requires absolute cleanliness and the local use of an alum or tannin wash.

ADDITIONAL PRESCRIPTIONS.

R—Hydrarg. ammoniati gr. xx
 Acidi carbolici gr. v
 Ung. aquæ rosæ q. s. ad ʒj—M.

S.—For the scalp. Wolff.

R—Olei rusci gtt. xv-ʒijss
 Olei ricini ʒj-ʒij
 Olei bergamottæ et
 Olei citronellæ ʒss gtt. xv
 Æther. sulphurici ʒij
 Alcoholis fort. q. s. ad ʒvij—M.

S.—Apply once daily with a bristle brush. For the scalp.
 L. Heitzmann.

R—Liq. carbonis deterg. miv-mx
 Glycerini ʒss
 Aquæ rosæ q. s. ad ʒj—M.

S.—Local use. For the scalp. J. F. Payne.

R—Olei amygdalæ dulcis ʒj
 Acidi carbolici gtt. xx
 Olei limonis ʒj
 Aq. destillatæ ʒij—M.

S.—Local use. For the scalp Van Harlingen

R—Olei rusci	3jvss
Vaselini alb.	3vss
Paraffini	3j
Olei bergamottæ	3jss
Ol. citronellæ	3ij—M.
S.—Rub in with fingers. For the scalp.	L. Heitzmann.
R—Acidi tannici	3j
Vaselini	3j—M.
S.—Local use. For the scalp.	Tilbury Fox.

COMEDO.

Description.—This is a disorder of the sebaceous glands in which their excretory ducts are plugged up by hardened sebum mixed with epithelial cells. According to Unna comedones are not the result of an abnormal secretion of sebum, but a product of hyperkeratosis extending from the general surface to the mouths of the follicles, and which contain, in addition to horny substance, normal sebum. For Sabouraud the comedo is a huge, degenerated seborrhoeic cocoon, and **acne polymorphe** is a further manifestation of this same degeneration.

The accumulations are usually black-topped, looking like grains of gunpowder, and cause elevations of pin-point to pin-head size; sometimes there is slight depression. If the skin be compressed on both sides of one of these little papules, a filiform, white or yellowish mass may be extruded. Cases of double comedo have been observed (Ohmann-Dumesnil). The usual situations of comedones are the nose, forehead, cheeks, chin, inside of ears, and also the chest and back. Comedones are present in all cases of acne. Crocker and others also report comedones as occurring in children; on the temples in girls, the occiput and forehead in boys, and the cheeks in infants.

Grouped comedones have been described by Thin and Crocker, which are said to occur mainly in the "flush area of the face, but also on the trunk." According to Unna the black heads of the sebaceous plugs are due to pigmented

granules and not to accumulation of atmospheric dirt, as commonly supposed. The microbacillus found in the comedo plug is looked upon by Unna, Sabouraud, and others as the essential factor in the production of comedones. The affection is most frequent in persons having a coarse skin, is due in most cases in part at least to disorders of digestion, and is also found in those suffering from various so-called strumous states.

Prognosis.—This is generally favorable, although the condition is often very unyielding.

Treatment.—Attention to diet, general hygiene, etc., as in acne, are prerequisites to a successful issue. **Locally**, stimulating measures are to be advised, together with the expression of the sebaceous plugs. For the latter purpose Piffard's ingenious comedo spoon may be employed. The following lotion may be used every night:

R—Saponis olivæ præp.,
 Alcoholis 3j
 Aquæ rosæ 3vij—M.
 S.—Rub in with a piece of dampened flannel.

If the face is made rough by these frictions, cold cream may be smeared on in the morning. The superfatted soaps mentioned under acne are also beneficial.

Unna recommends a paste of this sort:

R—Aceti 3ij
 Glycerini 5ij
 Kaolini 5iv—M.
 S.—Smear over surface at night.

Permanent obliteration of the sacs may be obtained by inserting an electrolytic needle for a few seconds.

Preparations of sulphur we regard as objectionable, as this drug apparently seems to increase the number of black heads.

The *x*-rays and actinotherapy have also been employed in treatment. In obstinate comedones on the back, we have had excellent results from the *x*-rays.

Stelwagon advises eight or ten mild to moderate sittings to contract patulous ducts. He also found a fairly strong

faradic current two or three times a week of material advantage in his cases.

MILIUM.

Description.—The usual definition of milium is a little subepidermic cyst caused by retention of secretion in a sebaceous gland. A. R. Robinson, however, has shown that they are sometimes due to the snaring off of a group of cells from a hair follicle or the deep epithelium.

Milia occur for the most part on the face, especially under the eyes, over the cheeks, and on the forehead. They are of a whitish or yellowish color, and vary in size from a pin-point to a pin-head, and in numbers from two or three to dozens. When found upon the penis and scrotum they are much larger than elsewhere. They remain unchanged for years, but sometimes the contents undergo a calcareous degeneration, forming the so-called cutaneous calculi. It is not uncommon to find milia on the faces of newborn children (*strophulus albidus*), but it is to be noted that Phillipson regards these as sebaceous cysts. They are often seen in connection with acne, also on the sites of pemphigus bullæ, and in the wake of various ulcerative and atrophic conditions. A large, flat variety occurring in patches on the eyelids may be mistaken for xanthoma and perhaps for molluscum epitheliale.

Treatment.—They may be readily shelled out after a superficial incision, but by far the most ready method, as originally suggested by one of us,¹ is to puncture each little tumor with a fine needle attached to the negative pole of a galvanic battery.

When the milia are very small and numerous, Wolff recommends exfoliating the skin with a 50 per cent. resorcin paste or a strong salicylic acid solution in collodion.

¹ Hardaway.

ATHEROMA.

Description.—In size atheromata or wens vary from a pea to that of an orange. They occur as round, sometimes slightly flattened swellings that are elastic to the touch. The tumor usually slides freely over the underlying tissues, but the skin over it, though normal in appearance, is often adherent to the growth. Often at the apex of the cyst may be seen a black point, which represents an opening into the cavity of the tumor, through which a thick, whitish mass, often with a fetid odor, may be squeezed. An atheroma may suppurate spontaneously or after injury; after discharging its contents an ulcer covered with fungous granulations may be left which may closely resemble an epithelioma. At other times, after the rupture of the cyst, a cutaneous horn forms. In old cysts the contents undergo a calcareous change. Atheromata usually occur on those parts normally supplied with sebaceous glands, as the face, head, neck, and back, but exceptionally they have been observed in regions not supplied with sebaceous glands, such as the palms and soles. Some of these cysts are doubtless the result of occlusion of the ducts of sebaceous glands, with consequent accumulation of the secretions, while most of them, as Franke and Török, and, later, Chiari, have shown, are in reality allied to dermoids.

Treatment.—In most cases the best treatment of atheroma is to divide the skin down to the wall of the cyst, and then to dissect out the sac, taking care not to rupture it. Another method is to split open the sac, and, seizing its thick lining membrane with forceps, to drag it from its attachments: by this method there is liability to recurrence, as some fragments of the secreting membrane may be left behind. Lutz, of Honolulu, speaks in high terms of the use of iodine to cause an obliterating inflammation. The tumor is split open, contents evacuated, and interior painted with tincture of iodine. This is of especial application where the skin is so firmly adherent to the sac as to make it difficult to dissect it out. In small growths, after extrusion of the contents, electrolysis may be employed.

ACNE.

Description.—Acne is an inflammatory disease of the sebaceous glands, occurring mostly about the face and back, and characterized, according to the intensity of the process, by papular, pustular, or tubercular lesions. It is rare to find an acne that is purely papular or purely pustular, although one or the other form of lesion may predominate. The eruption is most frequently to be found upon the face, shoulders, chest and back, but it may occur wherever there are sebaceous glands, affecting more particularly, however, those connected with rudimentary hairs. The most common seat of the disease is the face, to which region it may be entirely confined, or be conjoined with more or less eruption elsewhere. In other instances the shoulders and back may be the only parts attacked. Acne is generally complicated with more or less comedo and seborrhea. As a matter of fact it is held that acne finds its explanation in seborrhea and the comedo, although there is some difference of opinion as to their relationship to each other. Clinically, some acne cases do not exhibit seborrhea, and every comedo does not develop into an inflammatory lesion. As a rule, it is a chronic affection, running its course slowly, and kept up by the appearance, from time to time, of new crops of papules or pustules. Subjective symptoms are not very marked. The number of acne lesions present in a given case may vary from two or three to several dozen.

For practical purposes it is well to recognize two clinical varieties of acne, viz., acne simplex and acne indurata:

Acne Simplex.—The eruption is usually made up of papules, papulopustules, and pustules. In some cases small, red pimples predominate (acne papulosa), which are somewhat conical in shape, and present at their apices minute yellowish or blackish points corresponding to the ducts of the sebaceous glands. The more frequent variety of acne simplex, however, is the papulopustular, with the pustules in excess (acne pustulosa). The pustules are freely dispersed over the invaded surface, have a somewhat

globular shape, and are seated upon an inflamed base. They vary from pin-head to split-pea size.

Suppuration may be abundant or slight; in *acne simplex* the evolution of the pustule is rapid; it may either rupture and discharge its contents, or undergo absorption and desiccation.

Acne Indurata.—This form differs in no way pathologically from the common variety, except in the extent of the inflammatory process. In *acne indurata* the inflammation is deeper seated; the subcutaneous connective tissue may be involved; there may be considerable swelling of the parts, and quite large subcutaneous abscesses may even form. The tubercles are usually slow in development and indolent in their course; in fact, a hard, inflamed nodule may exist many days before suppuration can be detected. Indelible *cicatrices* often result.

The so-called *acne artificialis* due to the ingestion or topical application of certain substances, *e. g.*, iodine, bromine, tar, etc., calls for no especial description. The eruptions thus caused may be slight or exceedingly severe. **Acne cachecticorum** or **scrofulosorum** occurs in the form of livid-red, pin-head to lentil-sized, soft, flat papules and pustules (Kaposi) that are usually found on the extremities of ill-nourished, strumous persons. T. C. Fox calls attention to an eruption of similar character in young children.

In this connection may be mentioned the *acne urticata* of Kaposi, which appears in the form of an acute development of pale-red, wheal-like elevations of the size of a bean to that of a twenty-five-cent piece. Itching and burning are marked. The lesions spontaneously subside in a few hours or two or three days, but often from scratching and squeezing the papules become indurated and crusted, and leave brown, cicatricial streaks in their wake. Frequent exacerbation is the rule. This disorder can scarcely be considered an *acne* in the ordinary sense.

Crocker, under the title of *acne keratosa*, describes a rare acneiform eruption that seems to resemble *acne urticata*. The papules are accompanied by severe itching, and begin also as urticaria-like elevations, but in *acne keratosa* the

lesions contain one or more conical plugs about one-tenth inch long, which seem to be the source of irritation.

Etiology.—Acne of the ordinary type does not usually attack children. It is most common from the age of puberty up to the age of twenty-four or thereabouts, although it may occur in more mature years. Acne may persist for a lifetime, but the great majority of cases tend to spontaneous recovery, at various periods, within the extremes stated above.

Next to eczema, acne is one of the most frequent diseases of the skin; indeed if all persons affected with it were to seek the aid of a physician, there is no question that it would occupy the first place in our statistical tables. Acne is found under all conditions of life, in all climates, and in both sexes equally. Uterine and gastro-intestinal derangements are frequent accompaniments of the disease.

Many authorities, following Unna, Sabouraud, and Gilchrist, are committed to the belief that acne is a parasitic disease due to a special organism, although acknowledging the necessity of a favorable soil for its production.

Gilchrist goes so far as to suggest that certain constitutional conditions, heretofore regarded as causing the disease, may be produced by absorption of the toxins of the acne bacillus.

Diagnosis.—The diagnosis of acne presents few difficulties. A papulopustular or tubercular syphilide may simulate an acne, and the same may be said of smallpox, but an error is next to impossible with moderate care.

Prognosis.—The prognosis of acne is essentially favorable; that is to say, it is in no way dangerous to life, and in most cases tends to spontaneous recovery in the course of months or years. It rarely persists through life, but in serious cases great disfigurement may ensue in the shape of cicatrices, or even keloidal growths, which latter, however, generally disappear in time. The removal of existing lesions is not usually difficult; the prevention of relapse will sometimes tax the ingenuity of the physician to the utmost. Strange as it may seem, severe cases are more manageable than light cases; but, taken all in all, the prognosis may be regarded as good.

Treatment.—Hygienic and dietetic measures are urgently demanded in most cases. Under the first head are to be recommended the tepid or cold-sponge bath, followed by brisk friction of the skin, which should be taken every morning, and also one or more Turkish baths a week. Patients should be encouraged to take regular exercise, preferably in the form of a walk of a half-hour's duration, morning and evening, although in weakly persons this should be approached gradually, as undue fatigue is always objectionable. Well-ventilated apartments and early hours should be insisted upon. As many acne patients suffer from dyspepsia and constipation, it is better to overcome these states by judicious feeding and regular habits, than by drugs, which only palliate and do not cure. Stimulating foods and drinks, such as soups, spices, gravies, pickles, cheese, wine, beer, spirits, tea, and coffee should be prohibited. Oatmeal, hot and fresh breads and cakes, pastry and fried foods generally are particularly obnoxious. Sweets and all kinds of nuts are to be avoided. Patients should be encouraged to drink milk¹ where it agrees, and to eat broiled beefsteak, mutton chop, roast beef, the white meat of fowls, and well-cooked and digestible vegetables, especially those that do not contain too much saccharine or starchy matters. Contrary to the popular idea, we are in the habit of forbidding fruit, especially raw, acid fruit, to acne patients. Cooked fruit is less objectionable. If constipation is a prominent feature, we order a large cup of hot water to be slowly sipped one hour before breakfast and on retiring at night. The addition of one-half teaspoonful of Carlsbad salts to the hot water in the morning is very useful, even where there is no constipation. Only enough water should be drunk at meals to secure mastication of the food, and on no account should a meal be prefaced with a goblet

¹ Bulkley insists that in order to get proper absorption of milk it should be given alone, pure or diluted, at the body temperature and at the conclusion of gastric digestion; that is, between meals, when the stomach is empty.—*Skin Diseases and Internal Disorders*, p. 112 *et seq.*

of iced water. It is well to drink copiously of water between meals, and especially should a glassful be taken about two hours after a repast. An action of the bowels should be solicited at the same hour every day, and patients should be warned not to read while at stool. Gentle kneading of the bowel in the direction of the colon at this time is also to be advised.

It is needless to say, that as regards **internal treatment** with drugs, we have no specifics. The so-called blood purifiers, such as sarsaparilla and iodide of potassium, are useless, and in the case of the latter positively injurious.

The treatment must necessarily be symptomatic. It should be our care to seek out all complications and remove them if possible. Dyspepsia and constipation are to be treated on general principles, if anything is required in addition to the dietetic and hygienic measures outlined above. Sometimes in plethoric subjects, when there is costiveness and a coated tongue and much local hyperemia, the *Mistura ferri acida* serves a good purpose:

R—Magnesii sulphatis	℥j
Ferri sulphatis	gr. iv
Sodii chloridi	℥ss
Acidi sulphurici diluti	℥ij
Infus. gentianæ.	q. s. ad ℥iv—M.

S.—A tablespoonful in a goblet of water, one-half hour before breakfast.

Another method of overcoming constipation is by the administration of a teaspoonful of common salt in a large glass of water one-half hour before breakfast. In obstinate cases, especially to begin with, a nightly pill of aloin, strychnine, and belladonna may be ordered. When the bowels are unusually sluggish the pills of iron and aloes (aqueous ext. aloes, 1 gr.; and sulphate of iron, 2 gr.), recommended by Spender, will be found valuable. One such pill should be taken three times a day at first, but afterward the dose should be rapidly diminished until one every few nights will be found sufficient. *Cascara sagrada* and *rhamnus frangula* are also of value. The routine administration of decided purgatives is, however, very bad

practice, and so soon as the bowels have been properly opened, it is best to try to keep up the regularity by the simpler methods first mentioned. In the anemic, iron is indicated. Some one of the numerous organic compounds of iron with albumin may be given as less prone to disturb the digestion.

The malt extracts and cod-liver oil are also suitable remedies in weakly young people, who have greasy skins, and suffer from cold hands and feet, or are of the so-called scrofulous habit.

An emulsion made in the following way is very eligible:

R̄—Olei morrhue	℥iv
Pancreatini saccharati	℥j
Pulv. acaciæ	q. s.
Glyceriti hypophosphitis,	
Syr. calcis lactophosphatis,	
Aquæ	℥ā ℥iv
Olei gaultheriæ	gtt. xxx—M.

S.—A tablespoonful three times a day, after meals.

When the acne is accompanied by considerable hyperemia and irritability of the skin, Taylor recommends that alkalies be given for periods of two or three months:

R̄—Potassii acetatis	℥j
Sodii et potass. tart.	℥ij
Syr. zingiberis	℥ij
Aquæ	q. s. ad ℥viiij—M.

S.—A tablespoonful in a wineglassful of water, after meals.

Bulkley speaks highly of the following mixture given in acne indurata:

R̄—Potassii acetatis	℥ss—℥j
Tr. nucis vomicæ	℥ij
Extracti rumicis fld.	f℥iv—M.

S.—A teaspoonful in water, half an hour before eating.

Where there is constipation, the same authority recommends the addition of 20 or 30 drops of the fluidextract of cascara sagrada to each dose, and if there be menstrual disturbance a further addition of 10 to 20 drops of the tincture of cypripedium.

In certain chronic cases minute doses of the bichloride

of mercury (gr. $\frac{1}{8}$) with tincture of cinchona bark may be tried. Menthol, 1 or 2 gr. after meals, is a favorite remedy with Whitfield.

Arsenic has been an almost routine prescription with many physicians in the treatment of acne. In the form of the bromide of arsenic in combination with the chloride of gold, we believe we possess a remedy of considerable value in suitable cases.

R—Arsenici bromidi	3ss
Aurii chloridi	gr. xv
Acidi nitrohydrochlorici	℥xl
Aquæ destillatæ	3vij—M.

S.—Dissolve the arsenic bromide in the acid; add the water and gold chloride with a few drops of bromine to make a clear solution.

The dose of this preparation is from 8 to 10 drops in one-half glass of water directly after meals. It is well, however, to begin with 3 drops and gradually to increase to 10 drops.

The sulphide of calcium sometimes acts well in pustular acne and in acne indurata. So far as we have observed, its influence is limited to the prevention of undue suppuration, but it does not seem to exert any permanently curative effect.

It should be given in the shape of gelatin-coated pills, and in the dose of $\frac{1}{10}$ to $\frac{1}{4}$ gr., three or four times a day. Payne believes that sulphur taken internally is often very beneficial.

The fluidextract of ergot in $\frac{1}{2}$ -drachm doses, three times a day, is occasionally useful, and again appears perfectly inoperative. We have not found the internal use of ichthyol of any advantage. It has been claimed that in the acne of young men due to sexual causes great relief has been produced from the passage of cold sounds into the urethra, also that hot vaginal douches have been equally successful with young women.

The so-called "opsonic" treatment (A. E. Wright), that is to say, with antistaphylococcal vaccine injections, is plausible in theory and probably will be valuable in

practice in certain conditions, but to the general physician the difficulty of its application will perhaps prove a bar to such utility as it may possess. Further details on this subject may be found in Part II.

The judicious local treatment of acne is of the greatest importance. The topical measures to be employed will depend largely upon the character of the disease present. As in all diseases of uncertain prognosis, there is an embarrassment of riches in the way of remedies, although in reality the therapeutic indications are relatively simple. The management of comedo, acne punctata, has already been considered (*vide ante*), but as common acne is due to and connected with the presence of comedones on the skin, some repetition is unavoidable.

In acne vulgaris or inflammatory acne it is often advisable to delay active treatment for a season and order simple soothing lotions or salves, such as the following:

R̄—Acidi borici	℥ij
Zinci oxidi	℥ij
Pulv. calaminæ præp.	℥ij
Glycerini	℥ij-℥iv
Aquæ rosæ q. s. ad	℥iv—M.

S.—Shake. External use.

R̄—Bismuthi subnitrat̄is	℥ij
Acidi hydrocyanici diluti	℥j
Glycerini	℥ij
Aquam rosam ad	℥iv—M.

S.—Local use.

In slight cases a powder of precipitated sulphur diluted with 2 or 3 parts of rice powder is often of advantage.

Another method in a similar class of cases, and which we have found very satisfactory, is the use of boric acid as recommended by Post:

R̄—Acidi borici	℥iv
Alcoholis	℥vii—M.

S.—Shake and apply several times a day, or whenever the skin is oily. Wash the face at night with a sulphur soap.

In the great majority of cases of acne, however, active measures are called for from the first. All comedones

should be thoroughly but gently expressed with a comedo spoon, preferably of the Piffard type; papules and pustules should be stabbed with an acne lancet and allowed to bleed freely, and the bleeding may be encouraged by fomentations with warm water. It is even well to prick the papules as soon as they appear, since their course is thereby much shortened. Fox and Jackson strongly recommend going over the surface, previously put on the stretch, with a blunt dermal curette, tearing off the tops of papules and pustules, thus allowing the easier extrusion of the follicular contents, and stimulating the skin to a healthier action. This operation may be repeated two or three times a week. Twenty-four hours after the scraping, Jackson employs a sulphur ointment, 1 drachm to 1 oz., or a bichloride wash, $\frac{1}{2}$ gr. to 1 oz. of alcohol, or the Kreuznach soap, No. 2.

Indurated nodules and cutaneous abscesses must be opened with a free hand. After the employment of any of these harsh mechanical methods the patient should foment the parts for a few minutes with cloths wrung out in hot water, and afterward mop on a soothing lotion.

It is not always easy to gain the consent of patients to this undoubtedly valuable but rough-shod method of procedure, and the physician must at times content himself with the absolutely necessary expressing of black heads, and the incision of such pustules and nodules as urgently require it.

In cases of moderate severity, frictions with green soap or the tincture of green soap are very useful, and with timid persons may, to a certain extent, supplement the lancet or curette.

R.—Saponis viridis,
 Alcoholis āā 3j
 Aquæ rosæ 3vj—M.

S.—Rub in with a piece of flannel at night.

After a few days a slight dermatitis will be set up and a certain amount of desquamation occur; when this happens the scrubbings may be intermitted and cold cream applied. For the same purpose Norman Walker prescribes a sulphur,

camphor, and balsam of Peru soap (Eichhoff), and offers the following practical suggestions for its employment.

With a shaving brush an abundant lather is produced, which is rubbed in for a few minutes. For the first few days it is wiped off with a damp cloth, but, later, when the skin becomes tolerant to it, the lather may be more and more thoroughly worked in until eventually there is none left to remove. As the skin will finally rebel against these frictions, one night in a week the skin may be simply anointed with cold cream or vaselin.

Without doubt one of the most efficacious methods of treating *acne indurata* is by the Vleminckx solution:

R _y —Calcis	.	.	.	.	.	.	.	3ss
Sulphuris sublimati	.	.	.	.	.	.	.	3j
Aquæ	.	.	.	.	.	.	.	3x—M.

Boil down to six ounces and filter.

In *acne* of the back this solution may be used diluted one-half with water at first, and then, after tolerance is established, of full strength. We are indebted to C. Heitzmann for directions as to its systematic employment in *acne* of the face. Before the use of the solution is commenced, some time—in severe cases several weeks—should be consumed in getting rid of flesh-worms by inunctions with strong lather of green or castile soap; also during the treatment the emptying of comedones must be kept up and continued from time to time to prevent relapses, and all lesions must be incised. The preparatory treatment having been accomplished, the patient is directed to commence with the solution in the strength of one teaspoonful to five of water; after three or four days he will take one to four and one-half of water; then one to four, and so on with one teaspoonful less of water every fourth night until the remedy comes to be used pure. Sometimes the solution cannot be pushed to its full strength, and the result is obtained with dilutions of one, one-half, one-third, or less; or it may be that, instead of increasing the strength every fourth night, we must pause at a given dilution for a week or more, and then proceed gradually. The remedy should

be merely mopped on at first; and afterward, if it is tolerated, rubbed in more firmly. If much dermatitis is set up, a little cold cream may be smeared on during the day, or the applications may be intermitted for a short while.

What is called the "shelling method" accomplishes much more quickly the desquamation of the skin that is sought by the slower process described above. This process has the disadvantage that the patient is confined to the house during its progress, and occasionally more serious inconveniences may ensue. We, nevertheless, recommend it highly when the consent of the patient can be gained after a frank statement of its unpleasant features. The following pastes are usually employed for this purpose:

R—Resorcini	3ss
Zinci oxidi	3j
Terræ siliceæ	gr. xij
Adipis benzoati	q. s. ad 3j—M.
S.—Apply to the face spread upon lint.	Unna.

This may be kept on for twenty or thirty minutes, then washed off with warm water, and a cold cream applied, or talcum. The paste may be put on nightly, or, if quicker action is desired, two or three times a day.

Lassar's preparation is as follows:

R—Naphtholis	gr. xxxv
Sulphuris præcipitati	3iij
Vaselini,	
Saponis viridis	ss 3jss—M.

This is to be spread upon the skin to the thickness of the back of a knife-blade, and left on for fifteen or twenty minutes, when it will cause a little burning. It is then to be wiped off with a soft cloth, and the skin powdered with talc. The paste may be repeated daily. The skin soon becomes inflamed, then turns brown, and finally peels off. The desquamation can be hastened by the application of Lassar's paste with 2 per cent. of salicylic acid. When the desquamation has ceased, the acne will be found to be greatly benefited.

Stelwagon advises, for the same purpose, a 25 to 50 per cent. alcoholic lotion of resorcin, which may be mopped on two or three times a day.

The same author recommends formaldehyde solution for the back, using it in sufficient strength to produce considerable irritation; afterward a boric acid powder may be dusted over the surface. The underclothing should be frequently changed.

In many cases of acne, in which the more active measures just described cannot be carried out, or, from the nature of the condition present, are not indicated, good results may be often obtained by other means.

Chief among the remedies stands sulphur, and, perhaps, the most generally useful method of its application is in the form of the *lotio alba*:

R—Zinci sulphatis,
Potassii sulphureti āā gr. xxx-5ij
Aquæ rosæ 3iv—M.
S.—Shake well. Apply daily.

The resulting mixture should be of a white color and not brown or black as usually dispensed. The strength of the mixture must depend upon the condition of the skin to be treated, the usual prescription, however, being 1 drachm of each of the salts to 4 oz. of water. Sometimes it is well to add a little glycerin, 3 to 4 minims to 1 oz., to relieve the harshness of the skin that the lotion produces. To increase the stimulating quality of the mixture in sluggish cases, 1 drachm of sulphur may be added.

Other preparations of sulphur in lotion form are as follows:

R—Sulphuris præcipitati 3j
Alcoholis 3iv
Ætheris 3iijss—M.
S.—Shake. Apply at night and once or twice during the day.

R—Sulphuris loti 3iij
Spt. camphoræ 3iij
Sodii biboratis 5ij
Glycerini 3vj
Aquæ q. s. ad 3iv—M.
S.—Shake the bottle and apply freely.

R—Sulphuris præcipitati	3ij
Pulv. camphoræ	gr. x
Pulv. tragacanthæ	gr. xx
Liq. calcis,	
Aquæ rosæ	aa 3ij—M.
S.—Shake. External use.	Kummerfeld.

This last prescription is especially useful.

Ointments are also advised in the treatment of acne, but they are not so serviceable as liquid preparations. They should be thoroughly worked into the skin:

R—Sulphuris hypochloridi	3ij
Potassii carbonatis	gr. x
Adipis benzoati	3j
Olei amygdalæ amaræ	gtt. ij—M.
S.—Rub in a small quantity at night.	Wilson.

The following is a very acceptable preparation:

R—Sulphuris præcipitati	3j
Ung. aq. rosæ	3j—M.
S.—Apply at night.	

Ointments of the various mercurial preparations have been prescribed for cases needing active stimulation, *e. g.*, proto-iodide of mercury (5 to 10 gr. to 1 oz.), and the white precipitate (20 to 30 gr. to 1 oz.).

Lotions containing mercury are occasionally of service:

R—Hydrarg. bichloridi	gr. j
Tr. benzoini	3ij
Mist. amygdalæ	3vj—M.
S.—Apply lukewarm.	

To the sluggish nodules of acne indurata we are in the habit of applying Unna's salve muslin of mercury and carbolic acid.

Hutchinson touches lesions as they appear with a small quantity of the acid nitrate of mercury. W. G. Smith prefers the pure carbolic acid, afterward covering the spot with a film of collodion. **Faradization** of the face with a sponge electrode—the positive pole to the nape of the neck and the negative to the affected parts—is often very useful. The applications are to be kept up for ten or

fifteen minutes, at intervals of a few days. We do not think so well of galvanism.

The **high-frequency current** has taken the place, in our hands, of the faradic and galvanic currents, and is undoubtedly more efficient. It should be applied by means of the hammer electrode held about one-quarter of an inch from the face, and continued sufficiently long to produce a slight reddening of the skin.

Pospelow and Jackson strongly recommend **massage**. According to the first-named authority the rubbing should follow the direction of the gland ducts and muscle fibers of the skin in order that the sebum may be expressed from the glands. It should be employed for ten minutes at a time, morning and evening, and kept up for several months. Hyde's ingenious "massering ball" may also be employed in this connection.

The **x-ray**, in the opinion of many practitioners, is the best agent at our command in the treatment of acne. Török and Schein consider it the most reliable of any treatment known. While we hold that many of the older forms of treatment are too valuable to be abandoned, and that some cases of acne cannot be cured by the rays alone, we are ready to admit that no one procedure is so generally of benefit as the use of the rays.

The best results are obtained with a soft tube and a very faint light, such as shows the soft tissues of the hand black against a dimly lighted screen. It is difficult to believe that an agent apparently so weak can have much effect, until one has witnessed a demonstration of the fact. This effect is produced in several ways: by an increased leukocytosis; by increased lymph supply, thus raising the local opsonic index; by bringing about a vascular constriction, and by gradually producing an atrophy of the sebaceous glands. Pusey believes in a bactericidal effect as well. Eight-minute sittings at 8 inches may be given three times a week. Stelwagon is more cautious and advises sittings of three to four minutes, three times a week, at 10 to 15 inches distance. He apparently uses a stronger light than we advise.

If erythema appears, sittings should be at once discontinued. The danger of producing atrophy must not be forgotten. The eyes should be shielded by spectacle frames covered with sheet-lead, with side blinkers of the same material. The scalp must also be protected.

Leredde and Belot speak well of phototherapy.

Reports from the Finsen Institute show cure of one-half the cases treated.

Among the new suggestions,¹ in the management of this disorder, may be mentioned the cylindrical punch of Kromayer, which is a device for removing minute pieces of skin containing the affected glands. It is in effect a Keyes punch operated by a motor or dental engine. Another plan of treatment (Moschkowitz) is the use of dry cups to the parts affected for one-half hour once or twice a day, employing slight suction only and permitting each cup to remain in position for one or two minutes. (See article on Passive Hyperemia, Part II.) Stelwagon in his textbook recommends going over the face with a small cupping glass—about 1 inch opening—and speaks of the method as very satisfactory.

ADDITIONAL PRESCRIPTIONS.

R—Sulphuris præcip.	3j
Calaminæ	3ij
Zinci oxidi	3iij
Glycerini	3j
Aquæ destillatæ	q. s. ad 3iv—M.
S.—Shake and apply with a brush.	Walker.
R—Sulphuris sublimat.	3ij
Ætheris,	
Alcoholis,	
Glycerini	aa 3ij
Liq. calcis,	
Aquæ rosæ	aa 3iv—M.
	Crocker.
R—Sulphuris præcip.	3ijss
Alcoholis	3jss
Spt. lavandulæ	3iij
Glycerini	3ss—M.
	Hebra.

¹ Quoted by Gottheil in *Progressive Medicine*.

412 DISEASES OF THE SEBACEOUS GLANDS

R—Resorcini ʒss- ʒij
 Acidi borici ʒj- ʒij
 Zinci sulphatis gr. xx-xxx
 Alcoholis ʒss
 Aq. destillatæ q. s. ad ʒiv—M.
 S.—External use. Stelwagon.

R—Adipis lanæ ʒijss
 Acidi acetici diluti ʒijss
 Adipis benzoati ʒijss
 Sulphuris præcip. gr. xl—M
 S.—External use. Unna.

R—Bismuthi subnitratæ,
 Hydrarg. ammoniati,
 Ichthyolis āā gr. xxx
 Vaselini ʒv—M.
 S.—Apply thickly before bedtime. Hebra-Ullmann.

R—Sulphuris præcip. ʒj
 Pulv. camphoræ gr. xx
 Ung. aquæ rosæ,
 Vaselini āā ʒiv—M.
 Van Harlingen.

R—Sulphuris præcip. ʒiv
 Tr. saponis viridis ʒx
 Glycerini ʒvj
 Alcoholis ʒj—M.
 Elliott.

R—Sulphuris præcip. ʒss
 Glycerini mxxx
 Spt. camphoræ mij
 Liq. calcis q. s. ad ʒj—M.
 S.—External use. Payne.

R—Zinci oxidi ʒj
 Ichthyolis gtt. xx
 Sulphuris præcip. ʒss
 Ol. lavandulæ gtt. iv
 Pulv. amyli ʒiij
 Vaselini q. s. ad ʒj—M.
 S.—Apply as a paste. Wolff.

ACNE ROSACEA.

Description.—This is a chronic, hyperemic or inflammatory affection of the skin, occupying principally the region of the face, and more especially the nose, cheeks, chin, and forehead. We have also seen it well marked on the neck. The prominent clinical features are redness, papulation, and pustulation, the appearance of dilated bloodvessels, and sometimes an excessive new formation of connective tissue.

It is customary to divide the disease into three stages, but one stage does not necessarily follow the other.

Generally, simple hyperemia is first observed; later on the congestion becomes permanent; the vessels dilate, the skin is thickened, and a secondary acne supervenes; finally, but by no means in all cases, or even in the majority, the morbid process advances a step farther, and decided hypertrophic changes occur, and the parts involved, particularly the nose, will assume a lobulated and hob-nailed appearance, and in aggravated cases broad bands and pedunculated red tumors of the size of the fist may be formed (Rhinophyma).

The clinical picture presented in rosacea varies a good deal in different cases, and from time to time in the same case. A form of the disease is common in ill-conditioned young people in whom there is simple redness of the skin, with a cold surface, and more or less accompanying seborrhea. Here the nose is the common site of the disorder.

In another class of cases the degree of hyperemia changes from day to day or from hour to hour; sometimes the face is all aflame, and again almost normal, or there is much complaint of burning and even slight itching. Sometimes the vascular dilatation is the most prominent element in the case, and there will be little or no intervening hyperemia of the skin. A common seat of rosacea in women is upon the chin.

The **causes** of acne rosacea are numerous. Among

the more common are menstrual irregularities, anemia, chlorosis, dyspepsia, constipation, the gastric catarrh of drinkers, and exposure to excessive heat or cold.

A recurrent inflammation of the hair follicles just inside the nose is a not uncommon cause of a chronic redness at the end of that organ. Chronic nasal disease and conditions that interfere with the local circulation must also be taken into account. In men rosacea is most frequent after forty years of age, although not uncommon in quite young men; and in women it is most apt to supervene at puberty or at the menopause. The disorder is nearly always a reflex one. Its initial stage is caused by prolonged or often repeated stasis in the capillaries, and all the subsequent pathological changes find their explanation in this fact. Unna urges that the prefix "acne" should be dropped entirely, for that rosacea is in 19 out of 20 cases seborrheic, and only rarely an angioneurosis, and that this latter condition never leads to hypertrophy.

As a rule, the **diagnosis** presents few difficulties. Acne rosacea should be differentiated from simple acne, lupus erythematosus, lupus vulgaris, and the tubercular syphilide.

Prognosis.—The prognosis in cases of mild grade is generally favorable, and even where the disease has existed for a long time, if the cause can be ascertained and removed, gratifying results may be obtained. On the other hand, palliation is frequently all that can be promised.

Treatment.—The treatment is both internal and local. The cause or causes of the disease should be diligently sought and removed if possible. The same general rules as to diet and hygiene, mentioned in connection with acne, are equally applicable here.

In chronic gastric catarrh, Carlsbad salts, one teaspoonful in a goblet of hot water taken one hour before breakfast, and 10 gr. each of carbonate of magnesium and subcarbonate of bismuth after meals, may be given with advantage. Lavage of the stomach is also useful in some cases. Ichthyol in 3- to 6-minim doses, in pill or capsule,

is also advised. We have seen marked improvement from its use. Dyer obtained a good result in a case of hypertrophic rosacea from the administration of thyroid extract. **Topically**, the applications should be suitable to the stage of disease present. In the hyperemic stage ointments and lotions of sulphur and mercury are indicated. (See Acne.)

Kummerfeld's lotion is recommended by Van Harlingen:

R _i —Sulphur. præcipitati	3j
Pulv. camphoræ	gr. v
Pulv. tragacanthæ	gr. x
Aquæ rosæ,	
Liq. calcis	aa 3j—M.

S.—Apply once or twice a day.

In cases of the second degree all pustules should be opened, tubercles freely incised, and the invaded region should be fomented with hot water several times a day. The best local application in our experience is Vlemminckx's solution, which should be employed in the manner described under the treatment of acne. We have derived benefit from daily painting with the 1 to 1000 adrenalin chloride solution.

The best method of destroying the varicose vessels is by electrolysis, as first suggested by one of us many years ago.¹

A fine jeweller's bristle or dental reamer is attached to the negative pole electrode of a galvanic battery (by means of a suitable holder) and the needle is inserted into the vessel for a sufficient depth; the circuit is then closed by the patient touching the positive sponge electrode with the tips of the fingers, or, better still, by placing one or more fingers in a bowl of water in which this pole has been placed; after the electrolytic action has been developed, as shown by the vessel becoming a white line, the fingers are removed from the positive sponge electrode, after which the needle is withdrawn from the tissues.

Sometimes one puncture is sufficient for obliteration, but if the vessel is long, several insertions may be made along its course. If the operation is carefully done, no

¹ Hardaway, Archives of Dermatology, October, 1879.

scarring need result. It is true that a collateral circulation is often set up and the operation must be repeated; but in cases where the cause of the disease has been removed we have seen permanent results. In the mean time the improvement in the patient's appearance is very noteworthy. The strength of current employed will depend somewhat upon the locality operated upon, the size of the vessels, etc. It is probably best in various electrolytic operations on the skin to employ a milliampèremeter, but it is not absolutely necessary.

Various other methods of treating rosacea have been recommended. In cases of a marked type many employ some form of multiple puncture or scarification. Vidal speaks highly of what he calls linear quadrilateral scarifications. Shoemaker uses a needle-knife with which he makes numerous punctures, while at the same time he constantly applies hot or very warm water. Kaposi advises a solution of iodated glycerin (5 parts each of pure iodine and the iodide of potassium to 10 of glycerin), which is painted over the affected region eight to twelve times a day for three or four successive days, and immediately covered with gutta-percha paper. Carbolic acid, 1 in 2 to 6 of alcohol, is said to be useful by Duhring. Abraham recommends, in the first two grades of rosacea, the subcutaneous injection of 95 per cent. alcohol. Not more than 30 drops of the fluid are required, and the injections should not be made oftener than three times a week. Excellent results are claimed if strict antiseptic precautions are observed. Others advise the local application of absolute alcohol several times daily.

When redness of the nose, usually of the end of the organ, is due to inflammation of the hair follicles just within the nares, it is advisable to pluck the hairs and to keep a 10 per cent. ointment of xeroform or some similar preparation constantly applied. General tonic treatment (one or two teaspoonfuls of a mixture of equal parts of the glycerole of the hypophosphites and syrup of the lactophosphate of lime) is also helpful.

The X-rays.—The technique is similar to that used in acne vulgaris. Marked paling of affected areas and lessening of telangiectases have been observed.

The high-frequency current is often valuable. Galvanism has been used.

In the hypertrophic variety of rosacea with production of excessive outgrowth of tissue, ablation by the knife is the only remedy. We have relieved moderate degrees of thickening with electrolysis, plunging the needle quite freely into the tissues in various directions.

Multiple applications of the microcautery have been recommended.

Finsen, Leredde and Pautrier report results with phototherapy second only to those obtained in lupus. Thus the former had good results in 13 out of 25 cases, and the latter in all of 6 cases. Allen says that long-lasting redness of the nose and cheeks which electrolysis, scarification, and the scaling-off method have failed to relieve, may often be cured by persistent light treatment, with disappearance of dilated vessels and varicosities.

ACNE VARIOLIFORMIS.

Description.—This comparatively rare and little understood affection has been variously termed acne necrotica, acne varioliformis, acne atrophica, lupoid acne, acne pilaris, acné atrophique, etc.

According to Stelwagon, the various cases described as acnitis, folliclis, necrosing folliculitis, impetigo rodens, etc., are related to this disease, or are anomalous types of it. He also would include in this class, clinically, at least, acne agminata, the folliculitis exulcerans serpigiosa nasi, and the acne telangiectodes of Kaposi. Unna's ulerythema acneiforme is also believed to belong to this group.

The primary lesion in acne varioliformis is a papule from lentil to bean size, reddish brown in color, firm to the touch, with the summit, especially in lesions on the scalp,

generally pierced by a hair. In a few days the apex of the lesion presents a yellow, waxy appearance from which develops a yellow or brown crust, which, in three weeks or longer, falls off, leaving a depressed, supple scar suggestive of the pit of smallpox.

The seats of predilection of the eruption are the brow, the anterior border of the scalp, the temples, behind the ears, and on the neck; more rarely the affection may attack the trunk and the extremities. Unna says that there is a superficial and a deep form, the latter originating in the former. Sometimes the lesions occur in large numbers, and as the disorder pursues a chronic course, the disease may display different stages of evolution.

Etiology.—The etiology of the disease is obscure, some observers ascribing it to the syphilitic diathesis, others to the most diverse causes, such as arthritism, alimentary irritations, etc. Hyde and others suggest a tuberculous origin. Sabouraud asserts that the disease is always preceded by seborrhea and has its origin in the microbacillus described by him, followed by infection with staphylococci.

Acne varioliformis should be distinguished from acne vulgaris and the pustular syphilide.

Treatment.—The existing lesions are readily cured by inunctions with sulphur, white precipitate, resorcin, or boric acid ointments, or lotions of boric acid and resorcin, but relapses are common. When the patient is known to be syphilitic a mercurial treatment should be instituted.

One of us obtained a virtual cure with the x-rays in an aggravated case which had for years resisted a variety of approved methods. The technique was the same as advised under acne vulgaris, the only adjuvant being the application of Kummerfeld's lotion, *q. v.*

AFFECTIONS OF THE HAIR FOLLICLES.

CANITIES.

Description.—Canities, or grayness of the hair, may be congenital or acquired. In the congenital variety the grayness is usually limited to tufts, and this is sometimes observed to be a family peculiarity. The acquired form may be premature, or else occur in the course of advancing years. We have seen the hair remain permanently gray in the affected regions of alopecia areata. Abrupt changes of the hair from its normal shade to the whiteness of age have been often reported, and a few cases are on record in which the hair has changed several times from dark to gray and back again, and also where gray hair has become dark in extremely old people. The so-called “ringed hair” consists of alternate rings, of which one is normal in color and the next one gray.

The question of dyes for the hair is a matter for the hair dresser and need not be considered in this place. We may mention that certain hair dyes, notably walnut juice, or what is said to be walnut juice, often sets up a severe dermatitis of the face, neck, and ears.

We have, perhaps, observed 10 cases of this sort, which had resisted treatment until the cause of the irritation had been discovered and removed.

In certain cases of presenile graying of the hair, Anderson recommends attention to the general health and the internal use of arsenic.

HYPERTRICHOSIS.

Description.—Hypertrichosis, hirsuties, hypertrophy of the hair, or, as termed by the laity, superfluous hair, refers in a general way to that condition in which the capillary growth is unnatural. This abnormality may be in respect

to length, thickness of the hair, to the situations upon which it may occur, as well as to the age and sex of the person bearing it.

Hypertrichosis may be more or less general, except in places where normally there are no hairs, or it may be limited to certain regions; besides, it may be acquired or congenital.

Medical literature is full of examples of rare and unusual cases of hypertrichosis, but the dermatologist is practically interested only in the facial hirsuties of women. These cases are very distressing, and when the obnoxious growth occurs on the faces of young women, it is the source of constant mortification and mental depression, and in some instances leads to profound melancholia. Even older women, who have arrived at the time of life when, as Balzac says, a woman takes to the razor, are averse to such a deformity, and it is all the more distressing to those of the Anglo-Saxon race, in which, even after the menopause, hirsuties rarely develops.

The character of the growth as regards the amount of hair, its texture, and the locality implicated, differs very much in different cases. In rare instances there may be a full beard, as coarse as a man's,¹ or the hairs may be fine and comparatively few in number. In our experience the growth is more fully developed on the chin than elsewhere, next on the upper lip, and, lastly, on the cheeks near the margin of the hair.

Often when the beard is tolerably full on the chin there will be but little hair on the upper lip, and then mostly at the corners of the mouth.

The causes of hypertrichosis are more or less obscure, although theories accounting for its existence are sufficiently numerous. Racial tendency, heredity, and nervous

¹ The first operation ever made by electrolysis for facial hirsuties was in the case of Miss X., who had a patriarchal beard. The case was reported by Hardaway in the *St. Louis Medical and Surgical Journal*, November, 1877. In the *Philadelphia Medical News*, May 5, 1888, he published a supplemental account of this case.

influences may be mentioned as probable causative factors. Unna's theory is interesting. He believes that congenital hypertrichosis is due to a persistence of the fetal or primitive hair; in reality an arrest of development.

Acquired hirsuties is perhaps often the result of local hyperemia, brought about by various causes. Growth of hair under poultices, and upon the chests and arms of laboring men exposed to the heat of the sun's rays, etc., are cases in point.

Sulphur, for example, is a most powerful pilary stimulant, and we have seen a number of cases where the drug had been applied for months or years, in which hypertrichosis developed. The constant frictions were also, no doubt, an additional element.

It is also asserted that repeated exposure to the *x*-rays, as in acne, for example, is followed by a development of hair.

Certainly, as regards facial hirsuties, women of the Latin races seem to be particularly predisposed.

Hamilton called attention some time ago to the fact that insane women often suffer from hypertrichosis of the face. However this may be, it is a matter of observation that superfluous hairs will often set up profound derangement of the nervous system.

Our experience in the treatment of the facial hirsuties of women, which has been unusually large, has taught us that the apparent causes of this deformity are by no means uniform. We can emphatically state that in fully one-third of the cases there existed some sexual derangement, most frequently amenorrhea. Some few of the patients were more or less masculine in voice, figure, and mental traits. In no inconsiderable proportion hereditary influence was strongly marked. The fact that hairs are apt to develop for the first time at the menopause would seem to indicate that derangement or abeyance of the menstrual functions possesses a considerable etiological importance. Finally, in a certain number of patients there were no ascertainable causes for the hirsuties.

Treatment.—The destruction of the growth by electrolysis is the only permanent and satisfactory method. It was first proposed by Michel, of St. Louis, for the radical cure of trichiasis, and was afterward applied to the facial hirsuties of women by one of us.¹

For the purposes of this operation it is necessary to have a good galvanic battery, a number of fine needles, a suitable needle holder, a sponge electrode, and the necessary insulated cords. Originally a delicate sewing needle was employed, which was given up in favor of the jeweller's bristle, recommended by Fox; but of late years we use almost entirely the iridoplatinum needle, originally suggested by one of us,² which has the great advantage of being readily bent, and of not being easily broken; moreover, it may be made to follow the course of the follicle as a soft sound does the urethral canal, thus rarely penetrating the follicle wall, as often happens with the stiff needles.

Any suitable needle holder may be employed. A pair of light forceps with an easy spring is also required. We make use of a lens, but while this is not a necessity, it greatly helps along with the rapidity of the work.

The patient being seated in a reclining chair, facing a good light, the needle attached to the negative electrode is entered into the follicle, the hair being left *in situ* as a guide; after this has been accomplished, and not until then, the patient is told to place a couple of finger-tips on the previously moistened positive sponge electrode.³ The needle is not withdrawn until a slight frothing is observed

¹ Hardaway, St. Louis Med. and Surg. Jour., November, 1877; Amer. Dermatological Assoc., 1878.

² Hardaway.

³ Of late years it has been found much more satisfactory to place the positive electrode in a goblet or small bowl of water. The patient, instead of touching the sponge, places one, two, or three finger-tips in the water, as may be required. This simple device has many decided advantages. The usual methods followed in electrolytic operations, namely, grasping the sponge with the whole hand, or fastening it to some portion of the body, are barbarous, and, moreover, almost invariably lead to bad results.

around its stem, showing that the electrolytic action has been fully developed; but to avoid shock, the positive sponge electrode is first released by the patient, and then afterward the needle is removed, being exactly the reverse of the initial steps. An experienced operator will find no difficulty in introducing the needle directly into the follicle, and he can be assured of this fact by the following circumstances:

1. If the needle miss the follicle, and pass into the surrounding tissues, a sharp, pricking sensation will be experienced by the patient, but if the instrument be properly introduced into the mouth of the follicle, and allowed to sink by its own weight (and on this account a moderately heavy holder is preferred) to the bottom of the canal, no pain will be felt until the contact with the positive electrode occurs.

2. The practised operator will readily detect an unusual resistance if the needle fails to pass down the follicle.

3. In the majority of cases the proper direction of the needle is manifested by the appearance of the sebaceous secretion, and sometimes this is evident immediately upon the passing of the needle, even before the circuit is closed.

As a rule, a few seconds—twenty to forty—suffice for the destruction of the papilla; but this is largely a matter of experience and depends upon various circumstances, such as the strength of current employed, the character and situation of the hairs, etc. If the electrolytic action have been properly developed and skilfully applied, the hair will come away with the very gentlest traction of the forceps—a point always to be tested at once; but if force be required for its extraction it is a sign that the operation has been ineffectual, and the needle must be reintroduced at once, or the process may be repeated at a subsequent sitting. We usually employ ten or twelve cells of a freshly charged twenty-cell galvanic battery. The dry-cell chloride of silver battery is most convenient for the purpose, as it requires absolutely no attention until exhausted after years of use, but after a time the number

of cells will have to be increased. A current measurer is convenient, but not absolutely necessary, as we know from many years' experience. From 2 to 4 ma. are sufficient.

The amount of pain experienced differs in different people, and also according to the situation of the hairs; but generally a tolerance is soon established. We have found no benefit from the local use of cocaine either in oleate or solution.

The immediate effect of the electrolysis is the formation of an urticarial wheal, with the production of a variable amount of circumscribed congestion and perifollicular exudation; but as we always direct the patient to bathe the parts in very hot water, for ten minutes at a time, several times a day after each operation, this local disturbance readily subsides.

When the hairs are closely set it is not advisable to pass from each to its next neighbor, but they may gradually be picked out here and there at different sittings, until the whole field has been gone over. Thus, by the use of hot water to allay inflammation, and the selection of different localities for operation, the sittings may be more frequent, and the work considerably expedited; and, moreover, by using due caution and skill, scarring may be altogether obviated. On the upper lip, however, where the skin is thin, if the hairs are numerous, minute pits may be produced.

The same effect may ensue under exceptional circumstances in other situations, as, for example, when the hairs are very coarse and abundant; but it is certainly exceptional. From twenty to sixty hairs may be removed at each operation, and the sittings may usually last from one-half to three-quarters of an hour.

We believe it is an entirely tenable statement that from 80 to 90 per cent. of hairs are destroyed by the first operation, assuming, of course, that proper skill and suitable instruments have been employed. Hairs that return must be operated on again. It does not follow, however, that

all the hairs that reappear represent operative failures; on the contrary, in many patients, especially young people, the tendency to hair production still continues, and the electrolysis must be repeated from time to time. In older people, or in circumscribed regions, there is little or no tendency of this sort, and the returns really represent partial or complete failures. If the hair papilla and the hair-bearing surface of the follicle be destroyed, the hair, of course, cannot be regenerated; but it sometimes happens that the destruction has not been sufficiently radical, in which case it is necessary to do the work over again. A plan that we have long followed, and one that overcomes some of the causes of failure, is constantly to move the needle up and down, and from side to side, thus ensuring tolerably extensive destruction in and about the hair-bearing regions.

It is possibly true that the fine, downy hairs interspersed between the operable ones are stimulated to a lustier growth by the electrolytic depilation, but of this we are not quite convinced; but, even if this does occur, it makes very little difference, as in time they would assume larger proportions, even if left alone, and would have to suffer ultimate removal.

Bloebaum believes that the galvanocautery, using a fine iridoplatinum needle, gives better results than electrolysis. From an experience gained many years ago, we are disposed to doubt the value of this method, although it is possible that at that time we may have employed a faulty technique.

Kromayer has recently advised the use of a fine cutaneous punch driven by a motor or dental engine. He claims that 100 or more hairs can be removed at a sitting, and that the operation is not unduly painful and leaves no visible scars.

Other methods of removing hair, such as by shaving, epilation, depilatories, etc., are of no permanent value, and by unduly stimulating the growth are productive of more harm than good. If, however, for any reason, it is desired

to employ a depilatory, the best results are obtained from Boettger's paste of calcium sulphydrate, which is highly recommended by Dr. A. W. Brayton.

In some instances, as suggested by Bulkley, peroxide of hydrogen may be employed to bleach a slight growth of hair, thus rendering it quite inconspicuous, but we have not noticed that this practice in any way retards the growth.

The X-rays.—In order to estimate properly the value of the x-rays for this purpose, we must be informed as to the manner in which a hairy region reacts to the rays.

The first effect of the rays, or the effect of a mild dose, is to stimulate the cells of the papilla. This is the reaction sought for in the treatment of alopecia areata. A larger dose will cause shedding of the hair without precedent erythema. With a dose again a little increased, there occurs alopecia preceded by erythema. So far the effect on the hair papilla is transitory. Within a short time, usually two months, the lost hair reappears. This temporary alopecia, with or without erythema, is the desideratum in the treatment of tinea, favus, and sycosis.

With a still larger dose there may be severe dermatitis, with complete destruction of the hair papilla and consequent permanent alopecia. Unfortunately the destruction will not be limited to the papilla, but will involve other structures, thus resulting in scarring.

If the dose sufficient to produce a temporary alopecia be repeated a number of times, waiting each time for the disappearance of all inflammatory reaction, there will finally be induced a permanent atrophy of the papilla. While such a process need not involve scarring, the atrophy cannot be limited to the papilla, so that a certain amount of general atrophy will always be present. Besides atrophy, certain other late reactions, such as pigmentation and telangiectasis, may supervene. Even after a single "normal" exposure (see p. 566) of 4 to 6 H, according to Kienböck, late cutaneous atrophy may develop and continue for many months.

The *x*-ray treatment of hypertrichosis must, therefore, steer its way between such doses as will stimulate hair growth, or cause a merely temporary alopecia, on the one hand, and such as will cause severe inflammation and possibly deep destruction on the other. Between these extremes lie the dangers of late general atrophy and telangiectasis. The fact pointed out by Pusey, that the reaction required to cause removal of the hair varies considerably in different individuals, makes it impossible to obtain one's end without running a serious risk.

The same observer, equally distinguished for his success and his caution, says: "The method is so tedious and so beset with difficulties that I hesitate to advise it except in cases of hypertrichosis of exaggerated type." Altogether, at least with our present knowledge of technique, the procedure does not seem to us justified. Hypertrichosis is not a disease, entails no physical pain, and can be dealt with by other and less risky methods. The cases to which electrolysis is not applicable, such as those which present a copious growth of long, fine, downy hairs, are precisely those in which the rays fail most signally.

The process is a very slow one. Thus, Freund, in order to secure a permanent result, after the first fall of hair, gives monthly exposures for a year and one-half. Kienböck says that a permanent alopecia cannot be secured in less than a year or so of treatment by repeated irradiations of slight intensity, and that other methods with the rays are dangerous.

In one of Pusey's cases there was "a considerable return of hair" after one hundred and six sittings. A case which he regards as "entirely satisfactory" received over seventy-five sittings and at one time developed an acute dermatitis which "caused much anxiety." In another the improvement was "not satisfactory," after-treatment extending over three years.

Belot gives supplementary rayings of five or ten minutes every two months, and gives it as his opinion that "by this means we may hope to obtain a permanent alopecia

deformity and very probably bring about a cure. Singeing has much the same effect as clipping. The latter must be done with very sharp scissors, only a few hairs being cut at each snip.

TRICHORREXIS NODOSA.

Description.—*Trichorrexis nodosa* usually invades the hairs of the beard in the male, but it is occasionally met with in the hair of the head, and also among women. To the touch the hairs feel irregular and knotty, and upon casual inspection the beard looks ragged, and as if the ends had been singed. Upon closer inspection there will be observed along the hair shaft, shining, bulbous swellings, looking not unlike the ova of pediculi. The hairs are firmly seated in the papillæ, but fracture readily, the break occurring through the nodes. These little nodes are due to the splitting apart of the hair filaments, presenting an appearance as if the ends of two brushes had been pressed together and interlocked.

Raymond says that the disease is common on the hairs of the labia majora, especially in fat women, and also on the scrotal hairs in men. He believes it to be communicable, which fact would explain the apparently hereditary nature of a number of reported cases.

Hodara and others have described various microorganisms in connection with this condition, but this explanation is not universally admitted, and it is believed by many that mechanical causes or nutritional changes in the hair may be largely responsible.

The **treatment** of these cases is not very encouraging. Schwimmer recommends the following ointment, which may be rubbed in morning and evening:

R—Zinci oxidi	gr. vij
Sulphuris loti	gr. xv
Ung. aquæ rosæ	℥ss—M.

Sabouraud speaks highly of a lotion made in this way:

R—Hydrarg. bichloridi	gr. iv
Acidi tartarici	gr. viij
Resorcini	gr. xv-xxx
Alcoholis,	
Ætheris	āā 5jss—M.

Besnier advocates plucking the hairs and the application of pure or dilute tincture of cantharides. Shaving may be tried.

MONILETHRIX.

Description.—This disease, which was first described by W. G. Smith, affects usually only the hair of the scalp, and may be confined to localized areas at the temples, the crown or the back of the head. The hair is fine, sparse, and brittle, and the affected parts have the appearance of being bald; there is also present a marked degree of keratosis pilaris.

The hairs present, along their shafts, a series of smooth, solid nodes that extend from deep in the follicle to their ends. The internodal parts of the hair are lighter in color than the apparently nodular parts. The fracture always occurs in the part of the shaft between the rings, wherein it differs from trichorrexis nodosa. This disorder is considered practically congenital, inasmuch as it occurs very early in life, but it would seem that there are exceptions to this rule. It would also appear to be an hereditary affection. There is no distinctly curative treatment.

LEPOTHRIX.

Description.—This disorder, first described by Paxton in 1869, affects principally the axillary hairs and those situated on the genital regions. Upon microscopic examination the shafts of the hairs are found to be the seat of firm concretions, sometimes ensheathing them and sometimes arranged in the form of irregular nodules. The

hairs readily fracture, and to the unaided eye appear rough and without lustre. The masses are of an orange or red color, the latter due to the coexistence of red sweat. The disorder is due to zoöglea masses of elliptical cocci surrounding the hair. Montgomery recommends the following lotion:

R—Hydrarg. bichloridi gr. viij
Alcoholis dilut. ʒiv—M.

S.—To be sopped on either with the hand or with absorbent cotton, once a day after washing.

PIEDRA.

Description.—Dr. N. Osorio, of Bogota, first described this affection in 1876. It is almost exclusively found in Colombia and among women. The concretions are black, stone-like (hence the name) particles scattered irregularly along the shaft of the hair, beginning one-fourth to one-half inch from the root and extending to the point. The disease is caused by a fungus.

TINEA NODOSA.

Description.—Morris and Cheadle first described this fungus disorder of the hairs of the whiskers or moustache. The nodules consist of fungus spores similar to those of trichophyton. Parasiticides freely applied, and shaving or clipping the hairs will effect a cure.

FOLLICULITIS CAPILLITII DESQUAMATIVA.

Description.—One of us¹ elsewhere described a case in which small, grayish-white bodies closely resembling nits, were strung beadwise along the hair. They consisted of a mass of cells of the internal root-sheath which had be-

¹ Grindon, *Journal Cutaneous Diseases*, 1897, p. 256.

come loosened *en masse* and were carried up on the hair in its growth. There were slight perifollicular inflammation and alopecia. Beigel described a similar case.

Treatment was by epilation.

ALOPECIA.

Description.—This is a general term used to denote various degrees of loss of hair arising from various causes. Alopecia has been divided into the following varieties:

Congenital Alopecia.—Often the alopecia is only temporary, hair of normal calibre making its appearance in after-life. If the congenital baldness is limited to a small portion of the skin the defect is apt to be permanent.

Senile Alopecia.—The loss of hair in the aged generally begins on the crown of the head, and spreads gradually forward, then sideways and backward. Women retain their hair longer than men. There are accompanying atrophy of the skin and other evidences of advancing years.

Idiopathic Premature Alopecia.—In many persons, long before middle age, the hair begins slowly to fall out, and follows the course common to senile alopecia, except that there has been no antecedent grayness. The process is usually very gradual; the first strong hairs are shed, and are then replaced by those of weaker growth, and so on until the parts are left bare and shining. The hairs of the beard generally retain their pristine vigor. This condition is often hereditary. It is more than likely that further observations will show that most of these cases are in reality due to definite morbid states.

Symptomatic Premature Alopecia.—As its name indicates, this form of baldness is an abnormal loss of hair due to a variety of causes. It may be partial or general. The etiological factors in its production are numerous, of which the more frequent are general disturbances of nutrition, fever, mental emotion, dyspepsia, and prolonged overwork, and among the local causes are to be noted seborrhea,

eczema, lupus erythematosus, variola, erysipelas, syphilis, and leprosy. Syphilitic alopecia is usually an early manifestation of the diathesis, but may supervene later with the tubercular and gummatous lesions.

In our experience, women suffer more frequently than men from sudden thinning of the hair, and we have observed that this condition may occur, without apparent local cause, at irregular intervals. We are almost convinced that, in some instances at least, menstrual disturbances bear a relation to the alopecia.

Syphilis may also induce loss of hair in other regions than the scalp; for example, in the eyebrows and over the pubes, especially in women.

In the form of the disease known as **alopecia follicularis**, when the scalp has been invaded by the parasites of ring-worm or favus, the baldness may be permanent, especially when due to the presence of the *Achorion Schoenleinii*.

Alopecia Pityrodes.—This disease, also known as **alopecia furfuracea** and **pityriasis capitis**, is exceedingly frequent, and one of the most common causes of early baldness. It is rare before puberty, and is oftener observed in men than in women. One of the earliest symptoms to attract attention is the dandruff which falls freely over the coat collar and even may be seen in the hair as a fine dust. After the pityriasis has existed from five to seven years, as a general thing, the patient is alarmed by finding that the daily loss of hair is relatively greater than formerly. In the combings are found an increased number of "pointed hairs," or hairs that have failed to reach a full growth, but approach in type to lanugo. This process continuing, all the hairs in the affected areas become converted into lanugo, until, at last, even the downy growth disappearing, the scalp is left bald and ivory-like in appearance. Subjective sensations in the form of burning, tingling, or itching are sometimes complained of by patients.

At times the more distinctly seborrheal character of the affection may be noted, the scales being thicker and greasier.

Although clinically all cases of pityriasis of the scalp do not lead to baldness or even shedding of the hair, which fact Unna explains on histological grounds, it has long been known (Pincus) that this form of loss of hair is invariably associated with an abundant dandruff. This pityriasis is now regarded by Unna as a symptom of chronic desquamative catarrh of parasitic nature—the so-called seborrheic eczema of the scalp. According to Sabouraud common alopecia is a consequence of chronic, oily seborrhea, while alopecia areata is seen with the acute form. The so-called seborrheal cocoon, he states, found in the upper part of the hair follicle, between its opening and that of its sebaceous orifice, contains in its undegenerated stage an immense quantity of an almost pure vegetation of a microbacillus. The bacillus itself, being circumscribed in the upper third of the hair follicle, does not reach the papilla, but the lethal influence is produced by toxins generated in the neighborhood of the cocoon. This is not the place to discuss the different views of Unna and Sabouraud, but the practical fact remains that the therapeutics of these various affections must be based on the theory of parasitism. Granting the parasitic nature of the disorder, it is likely that a suitable soil, such as is furnished by debility, anemia, etc., may be a prerequisite for the development of the microorganisms. The disorder should be presumptively contagious, but the evidence is negative in this direction. However, the greater frequency of baldness in men than in women may be due to the fact that the former are more commonly exposed to infection in barber shops.

In addition to the alopecia pityrodes capillitii just described, Michelson calls attention to a universal form of the disease.

Prognosis.—The prognosis of the various forms of baldness will naturally depend upon the character of the predisposing or exciting causes back of them. The baldness resulting from local diseases of the scalp of a superficial character, *e. g.*, eczema and erysipelas, always ends in

recovery, while deep-seated processes, where ulceration and consequent scarring occur, leave permanent alopecia in their wake. The acute loss of hair following fevers, etc., is usually only temporary. The outlook in the idiopathic form of premature alopecia is always gloomy. Much can be done for alopecia pityrodes if the case is seen in the first stage of the disorder, before the scalp has become bald and adherent; but even then the utmost fidelity to instructions must be insisted upon, and the patient must be plainly told that time is an important element in the treatment.

Treatment.—In congenital baldness no particular plan of treatment is demanded, as the condition soon corrects itself; and in senile alopecia all medication is useless. Neither can we hope to effect much in idiopathic premature baldness. Attention to the general health, together with a strict surveillance of the habits and diet of the patient, and the use of local stimulating applications, are the means to be tried. The following preparations are worthy of attention:

R—Quinina sulphatis	gr. x
Spt. myrciæ	ʒiij
Glycerini	ʒj
Sodii chloridi	ʒij
Aquæ q. s. ad	ʒviiij—M.

S.—Local use.

Skinner recommends the following combination as a highly effective stimulant and antiseptic for the scalp:

R—Acidi salicylici	gr. xv
Resorcini	ʒss
Tr. cantharidis	ʒss
Tr. capsici	ʒj
Saponin.	ʒj
Lanolini	ʒj
Aquam rosam q. s. ad	ʒx—M.

Another formula given by the same writer is made thus:

R—Tr. cantharidis	ʒxiv
Tr. cinchonæ	ʒij
Tr. benzoin.	ʒvj
Spt. lavandulæ	ʒjss
Olei ricini	ʒij
Alcoholis q. s. ad	ʒx—M.

R.—Sulphuris præcip. 3j
 Vaselini 3j
 Olei limonis q. s. —M.
 S.—Rub in thoroughly every night.

Jackson, an authority on this subject, thinks poorly of “hair tonics” and insists that the best results are got from attention to the general health of the patient, massage of the scalp, and daily systematic and deep brushing.

Massage does not mean rubbing the scalp. It should rather be directed to moving the skin about on the underlying fascia, thereby stimulating increase of blood supply. The scalp should be grasped with the outspread fingers of both hands and moved forward and backward, from side to side, and with a circular movement, using a moderate amount of force. This done for five minutes twice a day is, perhaps, the most valuable of our therapeutic resources in simple uncomplicated baldness.

Stelwagon employs faradism with a metallic brush or comb, or static electricity, several times a week.

There is one agent, that we have used with really good results in the so-called symptomatic alopecia, especially in women, and that is the high-frequency current. We employ the ordinary hammer-shaped glass electrode, holding it about one-fourth inch from the scalp, and keep up the application for something like ten minutes. The sittings may be repeated two or three times a week.

The various forms of symptomatic alopecia must be treated according to the indications presented by the primary affection. The acute loss of hair, *defluvium capillorum*, following fevers, tends to spontaneous recovery. Shaving the scalp, as often advised by wig-makers, is unnecessary, and, we think, harmful. If the patient insists upon something being done any of the local stimulating preparations may be prescribed. In syphilitic alopecia, besides the constitutional treatment, recourse may be had to the daily inunction of 5 per cent. oleate of mercury or the application of a bichloride of mercury lotion.

In *alopecia pityrodes*, as in most diseases with a bad prog-

nosis, the number of remedies proposed is very large. The general indication is for stimulating applications.

In order to cleanse the scalp of dandruff the parts are to be shampooed thoroughly with the tincture of green soap:¹

R—Saponis olivæ præp. ℥iv
 Spt. odorati ℥iv—M.
 S.—Shampoo.

A tablespoonful of this mixture is poured upon the head and immediately afterward a teacupful of lukewarm water; this results in a copious lather with which the scalp is energetically shampooed; then the lather is washed out with at least a pitcherful of warm water.

Every night a very small quantity of a salve is rubbed directly into the scalp, and generally in five or six days the shampooing is repeated. Patients should be warned not to put their fingers in the salve box, but to take out the required quantity on the end of a toothpick or some similar implement.

Our preference is usually for sulphur and salicylic acid as local stimulants, prepared in the following way:

R—Acidi salicylici ℥j
 Sulphuris præcip. ℥j-℥ij
 Aquæ ℥xl
 Endermol q. s. ad ℥j
 Olei limonis q. s.—M

This prescription is also excellent, but more greasy than the preceding:

R—Acidi salicylici ℥j
 Sulphuris præcip. ℥j-℥ij
 Vasellini ℥j
 Olei limonis q. s.—M.

Usually in five days the shampooing should be repeated. In our judgment there is no pilary stimulant so useful as

¹ We always employ Bagoë's prepared olive soap, as first suggested by Fox. The *sapo viridis* of the shops is a much inferior article, and Bagoë's can be substituted for it with advantage where green soap is indicated. A similar soap known as Moeller's is extremely good.

sulphur, and under the plan of treatment just outlined, and adhered to for months, we have seen alopecia pityrodes very much benefited. A formula recommended by Lassar, containing pilocarpine, is very valuable, but it is difficult to prepare properly and has the disadvantage of being very costly:

R—Pilocarpinæ hydrochlor.	gr. xvij
Quininæ hydrochlor.	ʒij
Sulphuris præcipitati	ʒjss
Balsami peruviani	gr. clxxx
Medul. bovin.	ʒij—M.

If, for any reason, salves are not indicated, although that form of preparation gives the best results, recourse may be had to lotions. Montgomery recommends a bichloride lotion:

R—Hydrarg. bichloridi	gr. iv
Alcoholis,	
Aquæ destillatæ	aa ʒij—M.

S.—Apply by parting the hair, and rubbing well into the scalp every day or second day.

We are not at all partial to the use of the bichloride, as we have often seen considerable dermatitis of the scalp and neighboring skin caused by its use in solutions of moderate strength.

If the soap and alcohol extract too much oil from the hair, a little olive oil may be used to counteract this effect. A carbolic acid lotion is often beneficial:

R—Acidi carbolici	ʒj
Olei limonis	ʒjss
Glycerini	ʒij
Spt. odorati	q. s. ad ʒij—M.

S.—Apply to scalp with a medicine dropper, and then brush in thoroughly.

Morris has seen good results from chloral:

R—Chloral. hydratis	ʒiij
Alcoholis	ʒss
Glycerini	ʒij
Aquam rosam	q. s. ad ʒvj—M.

S.—Rub in thoroughly night and morning.

For the first stage of the disease Pincus recommends a tolerably concentrated mixture of sodium bicarbonate, but it is objectionable owing to the discoloration of the hair that results.

Ihle has employed resorcin with good effect:

R—Resorcini pur.	gr. xlviij
Olei ricini	℥viij
Spt. vini	℥iij
Balsami peruviani	℥v—M.

S.—Apply at night by means of a medicine dropper, and then rub in vigorously with a flannel rag.

Elliot recommends a lotion of 3 to 10 per cent. resorcin in equal parts of alcohol and water, or 3 to 5 per cent. resorcin ointment may be used once or twice a week or in alternation with the lotion. Brayton employs a lotion of salicylic acid and resorcin in equal parts of alcohol and water. A combination that is often serviceable is the following:

R—Resorcini	gr. xlviij
Tannin,	
Chloralis	℥℥ ℥jss
Tr. benzoini	℥ss
Ol. ricini	℥ij-℥iv
Alcoholis	q. s. ad ℥viij—M.

Bronson's pomade is also serviceable:

R—Hydrarg. ammoniati	℥j
Hydrarg. chloridi mitis	℥ij
Vaselini	℥j—M.

S.—Apply once or twice daily.

ADDITIONAL PRESCRIPTIONS.

R—Olei rosmarini	℥iv
Tr. cantharidis	℥iv
Olei amygdal. dulc.	℥ij
Spt. camphoræ	℥iij
Glycerini	℥j
Olei rosæ	gtt. viij
Pilocarpin. hydr.	gr. v—M.

S.—To be well rubbed in night and morning.

Whitla.

R—Resorcini 3j
 Quininæ (alkaloid) gr. xv
 Ol. ricini ℥x-xxx
 Alcoholis q. s. ad 3iv—M.
 S.—External use. Stelwagon.

R—Liq. carbonis deterg. 3j
 Hydrarg. ammoniati ʒj
 Vaselini 3j—M.
 S.—External use. For seborrheal alopecia.

R—Tr. cantharidis 3vj
 Glycerini 3ij
 Tr. nucis vomicæ 3ss
 Acet. destillatæ 3ss
 Aquæ rosæ q. s. ad 3vj—M.
 S.—External use. Tilbury Fox.

R—Acidi acetici 3ij
 Pulv. boracis 3ss
 Glycerini 3jss
 Spt. vini 3ij
 Aquæ rosæ 3iv—M.
 S.—External use. Cottle.

R—Pilocarpinæ hydrochlor. gr. xx
 Aquæ destillatæ 3ij
 Fiat solutio et adde:
 Lanolinum 3x
 Oleum petrolii 3vj
 Oleum bergamottæ 3ss
 Oleum verbenæ 3ss—M.
 Whitla.

ALOPECIA AREATA.

Description.—In this peculiar and striking form of alopecia the hair falls out more or less suddenly, exposing to view one or several, circumscribed, circular patches that are entirely bald. The scalp is the part usually involved, but other hairy regions, such as the beard, eyebrows, etc., may be implicated, and, as will be seen presently, the whole body may be divested of its hairy growth. Sometimes the disease is ushered in by certain premonitory symptoms, either in the shape of a severe persistent or periodic head-

ache, or there are present considerable burning and localized pruritus. However, these antecedent symptoms and sensations are not apparent in the majority of attacks, and most patients are otherwise in the enjoyment of good health.

In most instances the denuded areas are white, ivory-like, and apparently depressed; in an early stage of the disorder they may be slightly hyperemic. The sensibility of the affected patches is considerably lessened. There may be one or several patches present, varying in extent from the diameter of a silver quarter-dollar to the size of the palm. At the periphery of an extending patch the hairs are short and easily extracted, and exhibit club-like extremities. When recovery is about to set in, fine woolly hairs will first make their appearance, which in turn will likely fall out, to be succeeded by a still stronger growth of light hair, that gradually becomes normal in color and stoutness. The hair may come in quite gray and so remain. Relapses are more frequent than is commonly believed. One of our patients had an attack every spring for three or four years, evidently the result of severe training for boat-racing.

In the form of the disease properly called malignant alopecia the whole hairy system may be involved, as, for example, the hairy scalp, beard, eyebrows, eyelashes, pubic hairs, and even the hairs of the extremities. Occasionally vitiligo, atrophic condition of the nails, morphea, and scleroderma have been found associated with alopecia areata.

Etiology.—While it is a common experience that cases of alopecia areata are generally limited to a single member of a family, even where the opportunities for contagion are of the best, it is nevertheless true that epidemics of a disease resembling it in clinical features have been observed, especially in France.

The influence of nervous shock, mental anxiety, overwork, and of direct injury, in the production of alopecia areata cannot be doubted; and there is no question that

the majority of cases encountered in this country owe their existence to some of these causes. There is also a disorder characterized by baldness in areas which is probably parasitic, but it would hardly be profitable to recall all of the researches in this direction, since they have been largely contradictory and have lacked confirmation. Sabouraud has declared that alopecia areata and common alopecia are due to the same cause—a manifestation of seborrhea which, as is well known, he believes is due to a definite microörganism.

Diagnosis.—It would be possible to confound alopecia areata with *tinea tonsurans*; but the course and clinical history of the two affections are quite different, and in case of doubt a microscopic examination of the hairs would settle the question. In adults the differential diagnosis between the two diseases could hardly arise, since grown people usually do not suffer from ringworm of the scalp. Folliculitis decalvans, with its minute abscesses pierced by a hair, followed by irregular, smooth, white, depressed scars, should not be confounded with the very different lesions of alopecia areata.

Prognosis.—The prognosis in the mild forms of alopecia areata is generally favorable. The outlook is better for the young than for the middle-aged or the old. Recovery takes place in most cases in about three or four months; however, years may elapse before a permanent regrowth of hair occurs. The prognosis in the malignant type is bad.

Treatment.—In some cases tonics are apparently required internally, especially iron, arsenic, strychnine, hypophosphites. Defects of the general health should be remedied if possible, and since certain authors regard disorders of the teeth and visual abnormalities as possible causative agents in alopecia areata, diseases of these organs should receive proper attention.

The local management is, however, of the most importance, and may be summed up in the word **stimulation**.

Our usual plan is to blister the patches every two weeks with acetic cantharidal collodion or canthos, after thor-

ough washing with soap and water, and in the intervals to rub in morning and evening a lotion consisting of equal parts of tincture of cantharides and glycerin. If there are several patches, and of large extent, it is safest to apply the vesicant to one or two places only at a time. After weeks or months, as the case may be, the scalp begins to assume its normal appearance, and more downy hairs begin to appear, which gradually reach a normal calibre.

Trikresol, as recommended by McGowan, is a valuable topical remedy, and has, to a degree, taken the place of the cantharides in our practice. It may be applied in a solution with equal parts of alcohol, or in many instances lightly brushed on in its full strength. For children the trikresol should be employed much weaker. Pure carbolic acid acts similarly, but it has not appeared to be as effective. After the use of any of these vesicating remedies, ten days or more should be allowed to elapse before their reapplication, but after the skin has become normal, which takes a few days, mild stimulating lotions or salves may be employed in the interval as mentioned above. Numerous other remedies have been proposed. The following applications are to be noted:

R—Chrysarobini	gt. xxx
Vaselini	3j—M.
R—Olei amygdalæ dulcis	3j
Liq. ammoniæ fort.	3j
Spt. rosmarini	3v
Olei limonis	3j—M.

An ointment of 1 scruple of salicylic acid, 2 drachms of sulphur, and 1 oz. of vaselin is also valuable, and may take the place of the lotion of cantharides and glycerin.

Jackson speaks well of extract of pilocarpus, 1 drachm to 1 oz. of sulphur ointment.

Sabouraud blisters the patches and paints the raw surfaces with a solution of nitrate of silver (1 to 15).

Horand has found croton oil the most efficacious drug, and he does not think it dangerous.

Moty and others recommend injections of bichloride of

mercury into the patches. The hydrochlorate of pilocarpine has also been advised for hypodermic injection. Epilation of the loose hairs should be carried out as a routine practice, and is to be preferred to shaving.

Alopecia of the bearded face and the eyebrows does not admit of the use of harsh applications. In these situations we have secured the best results in a medicinal way by inunctions of weak sulphur ointments, and especially of a preparation advised by Lassar in general alopecia

R—Pilocarpinæ hydrochlor.	gr. ix
Quininæ hydrochlor.	ʒj
Sulphuris præcip.	gr. xlv
Balsami peruviani	gr. xc
Medullæ bovinæ	ʒj—M.

The bearded region should be kept constantly shaved, not only to obviate the contrast between the bald and hairy regions, but as a valuable method of obtaining a certain amount of local stimulation.

Galvanism and faradism have been a good deal employed in alopecia areata, but it is probable that the high-frequency current will be found much more efficient, and as a matter of fact this has been our experience. E. R. Morton, of London, has succeeded with this method in cases in which all else had failed.

In the universal or very extensive types of this disease described by Michelson as **alopecia maligna** x-rays have remained without avail. In the more localized forms, while uncertain and far from being a specific, they sometimes succeed where other means do not.

The use of the rays here may at first sight seem like an application of homeopathic principles. Its reasonableness, however, may be seen by reference to the article on **Effects of the Rays on Tissues** (p. 569). What is more strange is that the proper dose and quality of rays, as stated by Holz knecht and Kienböck, is the same as they employ to produce alopecia in the trichomycoses (see p. 453), using a little less for the beard than for the scalp. Evidently the papilla affected with alopecia areata does not

respond in the usual manner. This is shown by the course of events in cases successfully treated by the rays. First, the hairs at the margin fall out. Later, hairs appear in the diseased patch, and last of all the healthy marginal hairs return.

Holz knecht pursues one of two methods. Single or few patches are treated separately, the rest of the scalp being shielded. When, however, there are many patches the whole scalp is irradiated without respect to apparently still healthy portions.

That the ray is not a specific in this affection is shown by Hyde, Montgomery, and Ormsby. In 18 cases they observed prompt return of the hair in 2, marked improvement in 3, and no change in 13.

Pusey sagely warns us not too hurriedly to accept conclusions as to the value of any remedial measure in a disease like this, in which rapid recovery often occurs in the absence of all treatment.

Phototherapy has been used by several physicians with satisfactory results.

At the Finsen Institute, one-hour exposures daily are continued from one to eight weeks. Of 49 cases treated, 30 were cured. Sabouraud, after treating 40 cases with a smaller lamp, found the method uncertain. Kromayer treated 3 patients with his all-iron electrode lamp, all with success. Stelwagon believes this lamp to be sufficiently penetrating for the purpose.

It would seem that in an affection so generally amenable to treatment the simpler therapeutic measures should be given preference.

ADDITIONAL PRESCRIPTIONS.

R.—Alcoholis, 90 %	3j
Spt. lavandulae	3j
Aquæ destillatæ	3ij
Potassii nitratis	gr. j
Acidi acetici glaciale	gr. iv—M.
S.—Rub daily into the patches.	Sabouraud.

- R—Tr. cantharidis,
 Tr. capsici 3ss
 Olei ricini 3j
 Spt. odorati q. s. ad 3ij—M.
 S.—External use. Tilbury Fox.
- R—Ol. ricini 3ss
 Acidi carbolici 3j
 Tr. cantharidis 3ss
 Ol. rosmarini gtt. xv
 Spt. vini rectificat. q. s. ad 3iv—M.
 S.—Use with friction. Hyde and Montgomery.
- R—Acidi lactici 3j-3j
 Olei ricini 3ij
 Spt. vini q. s. ad 3iv—M.
 S.—To be applied daily, but with caution at first.
 Norman Walker.

FOLLICULITIS DECALVANS.

Description.—During the past several years there have been described, especially in France, certain classes of cases that have, in common, inflammatory changes in and about the hair follicle, and which finally result in permanent loss of hair and the presence of scars, and exhibit a general tendency to agmination.

The regions involved are preëminently the hairy scalp and contiguous parts, the beard, and less frequently other parts of the body. The following are some of the descriptive titles employed: Folliculite épilante, acné dépilante cicatricielle, acné décalvante, lupoid sycosis, ulerythema sycosiforme, folliculite et périfolliculite décalvantes agminées, etc. It would be rash to say that these various disorders are identical etiologically and pathologically, but, at least, they all have a clinical resemblance. As types of these affections several of the more well-defined may be briefly described:

Simple folliculitis decalvans, or **false alopecia areata**, begins as a folliculitis or perifolliculitis, but the inflammatory symptoms are slight, consisting of some redness and swelling about the hair follicles. The hairs fall out readily

and are not replaced, and when this occurs the inflammation subsides, but leaves behind atrophy of the papillæ and scalp. There is no pustulation. The patches extend irregularly and not by the gradual increase in area of round or oval lesions as seen in true alopecia areata.

Quinqua's disease usually attacks the scalp, but the beard, axillæ or pubic region may also be the seat of the disorder. In these cases a small pin-head sized pustule is pierced by a hair, the miliary abscess soon causing loss of the hair and destruction of the follicle.

The lesions appear in successive crops, but are few in number and isolated. The resulting atrophic patches are irregular in outline, about the size of a twenty-five-cent pièce, and scattered here and there over the scalp.

Ulerythema sycosiforme of Unna, as described in his own words, begins in the beard or the temporal region with flat, elevated (?), sharply margined, erythematous spots, on which appear superficial vesicles, crusts, and scales. It extends serpiginously with red, slightly elevated borders, following the course of the beard, and also attacking the region of the cilia and supercilia.

It is very chronic, and eventually leads to the formation of hairless, atrophic surfaces. The addition of an impetigo may give the disorder the appearance of a coccogenic sycosis. The atrophy, according to Unna, is never the result of suppuration, and the disappearance of the hair is merely a manifestation of the atrophy of the whole epithelium.

Treatment.—The treatment of these various disorders has not been satisfactorily worked out—in fact, for the most part is unavailing—but on the whole is, perhaps, in the direction of parasitocides and antiseptics. In the disease bearing his name, Quinquaud prescribes thorough ablution with soap and water, and the daily application of a mercurial lotion, viz.:

R—Hydrarg. bichloridi	. . . . .	gr. vj
Hydrarg. biniodidi	. . . . .	gr. j
Alcoholis	. . . . .	3vj
Aquæ destillatæ	. . . . .	3vjss—M.

SYCOSIS.

Description.—Sycosis non-parasitica, mentagra, folliculitis barbæ, is an acute or chronic inflammatory disease affecting the hair follicles, particularly of the beard, due to microbic infection, and characterized by papules, pustules, and tubercles perforated by hairs, together with infiltration of the skin and crusting.

It was formerly the custom to describe two forms of sycosis, the one parasitic and the other non-parasitic; the parasitic form being due to the inoculation of the fungus of ringworm. The bacteriological researches of recent years have shown that both disorders are parasitic, inasmuch as the affection now under consideration is the result of infection with microorganisms, the *Staphylococcus aureus*, *citreus* or *albus*, or other pyogenic germs. Unna suggests that the word sycosis be retained, and the one be called "coccogenic sycosis" and the other "hyphogenic sycosis;" and for still another clinical form the term "bacillogenic sycosis" may be applied.

Sycosis is mostly developed on the bearded portion of the face, but it may be found on other parts of the body supplied with hair, *e. g.*, the eyebrows, axillæ, pubes, the vibrissæ, etc.; even on the hairy part of the face it may be limited to the upper lip, or to small patches elsewhere. The disease may commence by the appearance of a few papules and pustules perforated by hairs, there being present at the same time a certain amount of heat and swelling of the parts. At other times an erythematous or moist eczema has preceded the eruption. Sycosis of the upper lip is commonly set up by the discharge from a chronic nasal catarrh. When the affection sets in acutely the local symptoms may be quite severe, consisting of great heat of the surface, considerable pain, tumefaction of the skin, and even enlargement of the contiguous lymphatic glands. The lesions in the beginning of acute outbreaks usually appear in considerable numbers and close together, but in

cases that have begun insidiously they are not so numerous and are discrete. In regions where the beard is thick, and which have been repeatedly attacked, considerable infiltrations may be observed, involving wide areas. It does not follow, however, that the disease always relapses in the same locality. The acneiform papules and tubercles soon become converted into pustules. The characteristic feature of sycosis is that each papule, tubercle, and pustule is pierced by a hair. During the papular stage extraction of the hairs causes considerable pain, but afterward, when suppuration has occurred, they may be readily and painlessly plucked from the follicle. The pus dries up into thin, brownish-yellow crusts, which upon removal will exhibit hairs seated in a shallow pit bathed in pus. More or less scarring and permanent alopecia results, and sometimes, in severe cases, the destruction of the tissues and glandular apparatus is very extensive. The diseased process is strictly limited to regions covered by hair, and does not step out of those boundaries.

Sycosis is a chronic affection, usually lasting months or even years, being kept up by relapses at irregular periods. According to Robinson, sycosis is primarily a perifollicular inflammation, the first changes occurring around the follicle in the perifollicular region. Later the follicle and its sheath become implicated. Scratching and free sweating are factors in its production under the armpits, and it is quite often secondary to scratching upon the pubes and labia.

Lupoid sycosis (Milton) is considered by some authors as identical with Unna's ulerythema sycosiforme, but Unna himself does not regard this latter affection as a coccogenic sycosis at all, but as a true ulerythema (*q. v.*).

It is a commonly accepted opinion that sycosis is the result, directly or indirectly, of the invasion of the follicle by pus organisms, the same pyococci that cause furuncle and impetigo (Bockhart). Robinson states that his own investigations demonstrated the presence of the *Staphylococcus pyogenes aureus* as well as *cereus* and *albus*; but

he declares, further, that the direct exciting agent may not in all cases be a pus organism, but some of the agents that produce ordinary papular or vesicular eczema, and pus organisms finding a favorable soil form a complicating factor. It is more than likely, as has also been urged, that there exists a number of predisposing conditions that render the soil more susceptible to infection, such as nutritive disturbances of one sort or another, special cutaneous vulnerability, acrid discharges, as from the nose, etc. It was formerly declared that sycosis was not contagious, but, aside from theoretical preconceptions, we are quite confident that the disease is often conveyed through the medium of infected brushes, strops, towels and fingers, in barber shops.

Diagnosis.—Sycosis must not be confounded with eczema (*q. v.*) and tinea sycosis. As regards the latter disease, in doubtful cases, the microscope will settle the question.

Prognosis.—The prognosis should be very guarded, as the disease is exceedingly obstinate and very prone to relapse; besides, being on the face, it is a very difficult matter to secure the coöperation of the patient in the matter of wearing salves, shaving, etc. However, as regards a particular outbreak of the disease, a cure may be promised under certain reservations.

Treatment.—Internal treatment, unless obviously demanded by other considerations, is altogether unnecessary. If a nasal discharge is responsible for a sycosis of the upper lip, it will be necessary to stop the discharge before the sycosis can be cured. In the acute stages of the disease soothing measures are required:

R—Olei amygdalæ dulcis	3ij
Liq. calcis	3ij
Acidi carbolici	ʒv-x—M
R—Zinci oxidi	3ss
Pulv. acaciæ	3j
Emuls. amygdalæ	3ij
Aquæ rosæ q. s. ad	3iv—M.

Olive or almond oil, lead lotion, and the black wash, followed by zinc ointment, are all useful for the purpose.

The hair should be closely cut, and if crusts have formed they must be first removed by inunctions with oil or hot poultices before the appropriate remedies are applied. Usually, when the patient comes under the care of a dermatologist, the disorder has reached a more chronic stage. It is at this time that shaving and epilation become indispensable parts of the treatment.

The beard should be shaved at least every second day, the crusts having been first removed, and the hairs epilated from all pustules. The patient will always demur to the shaving, having an idea, also shared by the barber, that the operation is impossible. A little firmness on the part of the physician will usually carry the point.

It is a matter of considerable importance to discard the shaving brush, for if it is not thoroughly disinfected after use it is quite possible to keep up the infection in this way. It is safer to employ the shaving creams, which may be rubbed in with the fingers. After shaving, or after epilation, the skin should be fomented for awhile with very hot water to relieve the congestion, and while this is being accomplished a soothing and somewhat astringent ointment such as the unguentum vaselini plumbicum should be applied, spread on strips of cotton and neatly bound on the affected surface. Robinson thinks well of the following combination:

R—Ung. diachylon,	
Ung. zinci oxidi	aa ʒjss
Ung. hydrarg. ammon. chlor.	ʒiij
Bismuthi subnitrat	ʒjss—M.

When the disease has become veritably chronic, more energetic measures still are advisable. While in the acute stage epilation should be practised only on hairs connected with pustules, it is now proper to pull them both from papules and pustules. To relieve the infiltration of the skin, rubbing with green soap, or the tincture of green soap, as in eczema, immediately followed by diachylon ointment, gives good results. Sulphur and the various mercurial preparations are also to be recommended. The

following preparation, conjoined with shaving and epilation, has served a good purpose:

R—Acidi salicylici	℥j
Sulphuris præcipitati	℥ij
Ung. aquæ rosæ	℥j—M.

S.—Rub in thoroughly twice a day.

We have found Rosenthal's paste, slightly modified, of extreme value:

R—Acidi tannici	gr. lxxv
Sulphuris præcipitati	℥ijss
Zinci oxidi,	
Pulv. amyli	aa ℥ijj
Vaselini	℥ijss—M.

S—Apply, quite thinly, twice a day.

This preparation, as well as Lassar's paste, is useful in axillary and pubic sycosis and other hairy regions on the trunk or legs. The frequent folliculitis of the back of the neck, which is mainly acquired at the barber shop, may be treated with boric acid solutions frequently applied, but above all by insisting upon strict antisepsis on the part of the barber. Vleminckx's solution used in the same manner as in acne is also a useful application in this locality.

Some authorities recommend going rough-shod over the affected parts with the dermal curette, following the operation with some emollient oil or ointment. After recovery the shaving of the beard should be kept up, at least for a long period, and if the skin is dry, red, and scaly, this condition may be benefited by using a salve of lanolin and cold cream.

Ichthyol in the strength of $\frac{1}{2}$ to 2 drachms to 1 oz. of excipient is recommended by Stelwagon in sycosis generally. Ehrmann suggests, as of practical value, a 10 per cent. solution of pyoktanin introduced into the follicles by cataphoresis.

In the treatment of this condition by the **x-rays** we must bear in mind that we are dealing with a highly susceptible region, the irritability of which is enhanced by the fact that it is already inflamed. While epilation is the most

important part of the treatment, it is not all. Particularly does this observation apply to such cases as we see in our clinics, presenting dense infiltration and deep-seated pockets of pus. As Belot well says: "No one has ever claimed for the *x*-rays the faculty of absorbing an abscess, or of taking the place of a bistoury." In the milder grades of the disease, such as occur in American private practice, the rays alone may effect a cure. Inasmuch, however, as it does not destroy the pus germs left in the follicles, and that these often infect the new hairs, we may be obliged, as with other methods of epilation, to work several times over the whole surface. In doing so, however, we court the risk of a permanent alopecia. In the worst cases, such a result is the best solution of the difficulty. But even in milder grades the *x*-rays present this advantage over other epilating methods, namely, that the alopecia so produced is of longer duration and, therefore, affords more time for the follicle to return to the normal.

Even in the deep, suppurative cases, however, Freund induces a notable amelioration in the inflammatory phenomena by a small number of exposures with a hard tube. Holz knecht and Kienböck adopt nearly identical methods. The latter, in cases involving the whole bearded region, divides it into four areas: the lips, the chin, and one for each cheek. The non-hairy portions, including the vermillion of the lips, are carefully shielded. 3 to 5 H. are given at one sitting, with a safe tube distance. Depilation begins in a week, with increased inflammation, discharge of small perifollicular abscesses, and, later, healing. When, about six weeks later, the beard reappears, shaving should be commenced and continued for many months, or, as Holz knecht says, a year or more. This is good practice after any method of cure.

Stelwagon gives ten or twelve exposures at two or three days' interval, beginning with five minutes at ten inches, and using a soft to medium tube.

Allen found phototherapy of use.

ADDITIONAL PRESCRIPTIONS.

R—Sulphuris præcipitati	3j
Balsami peruviani	3j
Ung. diachyli	3vj—M.
S.—External use.	Stelwagon.
R—Hydrarg. oleatis (2½%)	3j
Ammon. sulph. ichthyolici	℥xx
Acidi salicylici	gr. x
Olei lavandulæ	gtt. ij—M.
S.—Apply on strips of muslin.	Brooke.
R—Hydrarg. sulph. rubri	gr. vij
Sulphuris sublimati	3ij
Adipis	3jss
Ol. bergamottæ	q. s.—M.
S.—To be kept on constantly.	Lassar.
R—Xeroformi	gr. xv
Vaselini	3ijj
Lanolini	3vj—M.
S.—To be applied in subacute conditions.	

DISEASES OF THE NAILS.

ONYCHIAUXIS.

Description.—Onychiauxis is synonymous with increased growth or hypertrophy of the nails. Onychiauxis may exist in many degrees and varieties of thickness and deformity, a simple keratoma without other change, or, as generally happens, associated with alteration in texture, color, and shape. When the growth is chiefly forward the nail becomes bent and twisted, sometimes spirally, like a ram's horn.

In this condition, known as **onychogryphosis**, the nail is much thickened, strongly ridged both transversely and longitudinally, shining, but more or less discolored, of a yellow or brownish hue.

Onychauxis may occur in the nails of the fingers or toes. It is generally limited to the toes, especially the great toe, and is rarely seen on the fingers. The process is a non-inflammatory one, though the encroachment of the greatly thickened nail upon the soft parts laterally may occasionally set up a paronychia. Atrophic conditions may also coexist.

Gross neglect of the care of the nails, whereby irritative processes, with consecutive hypertrophy, are induced, is not an uncommon cause. In many cases met with in practice, various symptomatic factors are to be recognized. A hyperplasia of the nail cells occasionally occurs in connection with various affections of the nervous system, *e. g.*, chronic myelitis, neuralgia, etc.

Hypertrophy of the nail also accompanies psoriasis, pityriasis rubra of Hebra, pityriasis rubra pilaris, eczema, ichthyosis, syphilis, and occurs as a result of the invasion of the vegetable parasites.

Unna, under the name **scleronychia**, has described a condition in which the nails are thickened, inelastic, hard, rough, and of a yellowish-gray color, with disappearance of the lunula.

Treatment.—The treatment of onychauxis resolves itself into the correction of the traumatic influences, that is to say, relief from the pressure of ill-fitting shoes, cleanliness, care of the nails, necessary internal medication where systemic diseases are at work, and the appropriate remedies where inflammatory diseases have excited hyperplasia. An important point is the protection of the soft parts.

Surgical procedures, even to the point of removal of the nail and scraping the nail bed by means of the sharp spoon, are occasionally demanded.

Certain hypertrophic conditions of the nail associated with eczema, psoriasis, etc., may be satisfactorily treated with the x -rays.

ONYCHIA.

Description.—This is a term usually employed to denote inflammation of the matrix of the nail. The expressions *paronychia*, etc., usually indicate the degree and extent of the inflammatory condition present.

The most frequent causes are traumatic lesions, with consequent entrance of pus organisms, syphilis, leprosy, eczema, tuberculosis, *impetigo contagiosa*, and the fungous disorders.

One of the most frequent of the inflammatory affections of the nail is that called *unguis incarnatus*, or ingrowing nail. The great toe, at its outer nail border, is most frequently affected. Traumatism, the result of ill-fitting shoes, is the most frequent cause. Moreover, a greater or less degree of inflammation is sometimes observed about the finger-nails, constituting what is known to the laity as a "run-around."

Treatment.—In mild cases of onychia, Stelwagon advises frequent washing of the parts with saturated solution of boric acid and the continuous application of a 25 or 50 per cent. ichthyol ointment. He also advises painting both around and under the edges of the nail with a 2 to 5 per cent. solution of nitrate of silver in sweet spirits of nitre.

Jackson employs, in traumatic onychia, a 10 to 20 per cent. ointment of resorcin, or directs that the parts be painted with the tincture of iodine.

In our own experience, there is nothing so valuable in the ordinary forms of onychia and so-called *paronychia* inflammation as a 10 per cent. ointment of xeroform.

R—Xeroformi	gr. xlviij
Vaselini	3ij
Lanolini	3vj—M.

S.—Spread on patent lint and apply to parts.

In certain cases where the inflammation creeps slowly around the nail border, the skin may be gently pushed back

and the xeroform in powder form insinuated under the fold, the whole being covered with the ointment just mentioned. In acute onychia accompanied by intense pain of a throbbing character, division of the nail will give the speediest relief. In the phlegmonous variety it is usually necessary to remove the nail and then dress the parts with xeroform or the powdered nitrate of lead.

Where there is a suspicion of tuberculous infection, Shield insists upon the free use of the curette followed by the application of pure carbolic acid. In the strumous and syphilitic appropriate internal treatment is required.

The treatment of **ingrowing nail** is mainly surgical, but occasionally relief may be obtained by simpler means. The principal thing is the removal of pressure by wearing properly built shoes, and when this end has been secured the restoration of the axis of the nail bed and nail plate (Unna). This may often be effected by introducing some substance like sponge, lint, tin-foil, etc., between the nail and furrow. The size of the wedge may be gradually increased. Should ulceration and granulation be present, the sponge wedge, if that has been selected, is saturated with a 2 per cent. alcoholic solution of nitrate of silver.

Kaposi speaks very positively of the value of placing fibers of lint, the length of the nail fold, between the fold and the edge of the nail, after which soap plaster is wound around in circular slips, thus securing the threads and drawing the fold away from the nail. A method of treatment advised by Kinsman is as follows: After removing all pressure from the nail by cutting away the shoe, the ulcerated parts are thoroughly disinfected with hydrogen dioxide; then one drop of cocaine solution is applied, followed by one drop of Monsel's solution, after which the toe is covered over loosely with gauze. The process is to be repeated every second day until the nail is released by the retraction of the tissues.

Puerckhauer's method is said to be satisfactory, being both bloodless and painless. The nail is moistened with

warm 40 per cent. solution of caustic potash, and in a few seconds, as the surface becomes soft, it is scraped with a piece of glass, after which the solution is again applied and the scraping repeated until the portion of the nail to be removed is as thin as paper, when it can be lifted up with forceps and readily cut with scissors.

ONYCHOMYCOSIS

Description.—Onychomycosis is a disease of the nail produced by fungi. The fungi which invade the nail are *Tinea favosa* (favus) and *Tinea trichophytina* (ringworm). One or more nails may be affected with these disorders, the disease beginning in the nail bed and affecting the matrix secondarily, only rarely. The nail becomes more or less thickened, its texture is less dense, the surface loses its lustre, discoloration of a dull, yellowish hue ensues, and the surface may be more or less irregular from imperfect growth, and is furrowed and pitted in various ways.

Treatment.—For the treatment of these affections see the sections on Ringworm and Favus.

ATROPHIA UNGUIUM.

Description.—Atrophy of the nail may be either a congenital or acquired condition. In the congenital form various grades of defective growth, even to entire absence of the nail, will be observed. The acquired atrophies of the nail result, for the most part, from general or local disturbances of nutrition, as, on the one hand, syphilis and cachectic states generally, and, on the other hand, changes consecutive to eczema, psoriasis, parasitic affections, etc. Traumatism of different kinds effect retrogressive degenerations in the nail plate. The most marked instance of thinning and softening is seen in

pemphigus foliaceus. Several neurotic conditions, *e. g.*, neuritis, leprosy, and syphilis of the nervous system, are not infrequent causes of atrophy. The nails may become thinned and softened, or brittle and crumbling. Furrowing, discoloration, and a pitted or worm-eaten appearance and white spots, are also common symptoms.

Leucopathia unguium, or white nails, is a term used to describe the white spots or bands commonly seen upon the nails. They are due either to general nutritional disturbances, to nervous affections, or traumatisms.

Treatment.—The general treatment will depend upon the causative factors involved, when these can be ascertained. Empirically, arsenic may be given with some hope of benefit in most dystrophies of the nails, but its use must be long continued. Lactophosphate of lime and sulphur, the latter in the form of Garrod's lozenges, are also undoubtedly of some value. Locally, the parts should be protected by rubber finger-stalls, the wax finger, or other suitable means. Discontinuance of the manicure operations will often stop the production of the white spots often seen on the nails of young women.

PARASITIC DISEASES.

VEGETABLE PARASITIC AFFECTIONS.

FAVUS.

Description.—*Tinea favosa*, or favus, is a contagious disease, produced by the *Achorion Schoenleinii*, which is usually, although not invariably, confined to the scalp, and presents peculiar, variously sized, sulphur-yellow, cup-like crusts pierced by hairs.

It is comparatively rare in this country.

The disease may attack any part of the body, even, in very rare instances, the mucous membranes of the stomach and bowels, but it has a predilection for the scalp. In the first stages, which, however, the physician rarely witnesses, there arise erythematous patches attended by some itching and desquamation, and after a season there will develop the characteristic sulphur-yellow, umbilicated favus cups. As ordinarily encountered on the scalp, a somewhat complex clinical picture is presented, in which the observer will notice the lustreless state of the hairs, the masses of yellow crusts, and irregular areas of baldness, and detect a peculiar, musty odor arising from the diseased surface. Studied somewhat more in detail the following features are to be noted: In the beginning the favus crusts, which lie beneath the epidermis, are pin-head in size, pierced by a hair, and of sulphur-yellow color; they grow quickly, however, and soon attain the dimensions of a split pea; at the same time, according to Kaposi, the peripheral portion of the epidermis projects, but the part surrounding the hair remains on a level or else sinks slightly, thus producing the likeness to a little cup. The developed crusts

rise a line or more above the skin, are round or oval in outline, and are made up of several concentrically disposed strata; they are very friable, being readily crumbled between the fingers.

When, at an early stage, a crust is picked off the scalp, a slight depression, which soon fills out, may be observed; but later the underlying part will be found dry and atrophied, or sometimes the seat of suppuration. The lesions are at first discrete, but, as a rule, they finally run together to form dirty-grayish, mortar-like masses with a more or less irregular outline.

The hair becomes dry, brittle, and without lustre, as a result of the parasitic invasion; the follicles are eventually destroyed, and permanent alopecia results.

Sometimes no cups are present, but the scalp exhibits patches of a chronic, scaly redness; in other instances, according to Sabouraud, there is an impetiginous form with honey-like crusts. Occasionally the disease is met with on the general surface of the body—*tinea favosa epidermidis*, and the parasite also invades the nails.

Etiology.—Favus occurs mostly among the poor and ill-nourished, and attacks children more frequently than adults. It also is found on the lower animals, mice, cats, etc., and the contagion in some instances proceeds from these sources. While favus is a contagious disease, certain favorable conditions of soil seem to be required for its ready reception. The direct cause of favus is the presence of the vegetable parasite known as the *Achorion Schoenleinii*. The fungus invades the epidermis, especially the horny layer, the hair follicles, and the hair.

It has been claimed by some observers that there are different forms of the fungus, in some instances corresponding to different varieties of the disease, but this opinion is not general.

Diagnosis.—Favus is usually readily recognized. The yellow masses, made up of saucer-like crusts, the irregular bald areas, and the stale odor are characteristic. In cases just beginning, or in cases where the favus crusts have

run together to form mortary masses, it is sometimes necessary to suspend judgment for awhile. It is essential to distinguish favus from ringworm, eczema, psoriasis, seborrhea, and lupus erythematosus. In all suspicious cases the microscope should be appealed to, which, taken in connection with the clinical history, will generally establish the diagnosis.

Prognosis.—Untreated, the disease lasts for years, leaving in its wake marked disfigurement of the parts in the shape of scars and bald patches. Under the most favorable circumstances favus is an intractable disorder. A period of treatment averaging from four to twelve months may be expected under the older methods, and even after an apparent cure the patient should be inspected from time to time, to make sure of the permanency of the results.

Treatment.—The treatment of favus is entirely local, although tonics and nutritious food are helpful adjuncts. Stelwagon believes that sulphur in from 3- to 10-gr. doses, three times a day, has some influence on the disease. When the affection is seated on the scalp the first thing to be attended to is the removal of the crusts. After clipping the hair short the parts may be soaked in oil or poulticed, and subsequently washed with soap and hot water. The crusts having been removed, the next step is the removal of the hairs. Various plans of epilation have been suggested, such as Bulkley's epilating sticks, etc., but the simplest and surest is with the broad epilating forceps, and the easiest with the *x*-rays. The pain of the former process may be lessened by rubbing in a tolerably strong solution of carbolic acid. French writers advocate extending the epilation somewhat beyond the border of the affected area. A small amount of surface may be attacked at a time and the parasiticide applied at once.

The remedies that have been recommended in the treatment are very numerous, but we can mention only a few of the approved methods. Among the antiparasitic remedies most employed are tar, sulphur, carbolic acid, chrysarobin, pyrogallol, salicylic acid, sulphurous acid,

and the mercurials. Bichloride of mercury dissolved in ether or alcohol has given fair results:

R—Hydrarg. bichloridi gr. j-ij
 Alcoholis ʒj—M.

S.—Apply immediately after epilation, and twice a day thereafter.

Jamieson states that he has used Ihle's paste without epilation with much satisfaction:

R—Resorcini ʒj-ʒjss
 Lanolini,
 Vaselini,
 Zinci oxidi,
 Pulv. amyli aa ʒij—M.

The hair is kept short, the head washed daily with soft soap, and the paste applied immediately after the head is dry.

In the mean time, for the purpose of preventing the dissemination of the disease, the whole scalp should be treated with a saturated solution of boric acid or a carbolic acid lotion of the strength of 2 to 4 drachms to 1 pint. After a season the treatment may be suspended to judge of the results obtained. If the disorder reappears the same procedure must be repeated.

An old formula of Pirogoff's has been recently reintroduced:

R—Sulphuris sublimati ʒss
 Potassii carbonatis ʒj
 Picis liquidæ ʒjss
 Tr. iodi ʒjss
 Adipis ʒiij—M.

The head is shaved and a cloth smeared with this salve is applied for twenty-four hours. At the end of this time the crusts are removed and the scalp washed. The applications are repeated every twenty-four hours until active desquamation occurs, when inflammation is allayed by a soothing paste. Whatever method is employed in the treatment of favus, whether distinctly parasiticial, irritative, or mechanical, the object sought is to remove the fungus, and to accomplish this end requires minute attention to detail and unflagging patience.

What will be said more fully in the next section of the

use of the **x-rays** in tinea might be said in this place, except that it is not here so great a boon, since epilation by the older methods is much more efficient in favus than in tinea, for the reason that the hair-shaft in the former disease not being infiltrated, it comes out whole upon traction. Besides, thorough epilation is less efficient in favus than in tinea, as the fungus in the latter invades the follicle walls and is, therefore, left behind. The ray must, therefore, be supplemented by the use of antiseptics, thoroughly rubbed in after all signs of reaction have ceased. On account of the danger of reinfection, Török, Schein, Holz knecht, Kienböck, and Freund all advise epilation of the entire scalp, the latter recommending as an antiseptic, a strong phenol-lanolin, this drug being more inimical to the achorion than the iodine recommended by Sabouraud in ringworm.

Kienböck epilates the entire scalp at one sitting, dividing it into six areas, which are successively irradiated for a period of five to eight minutes each with an absorption of 4 or 5 H.

Sabouraud says: "Both diseases (ringworm and favus of the scalp) are amenable to the same treatment, which lasts a few weeks only, in place of the years required under the old method."

Epidermic favus should be treated by the usual parasitocides. Painting with tincture of iodine, or the application of a weak bichloride solution dissolved in collodion is generally efficacious. In favus of the nail, in addition to the application of the parasiticide, the diseased portion should be pared away.

ADDITIONAL PRESCRIPTIONS.

R—Cere flavae	3ij
Lacæ in tabulis	3iv
Picis burgundicæ	3x
Gummi damar.	3jss—M.

S.—Melt together and mold into sticks for epilating.

Bulkley.

R—Resorcini	3j
Ol. amygdal. dulcis	3ij
Lanolini	3vj—M.

S.—External use.

Crocker.

R—Acidi carbolici	3j
Ung. picis liq.,	
Ung. hydrarg. nitratis	āā 3ij
Ung. sulphuris	3iv—M.
S.—An ointment for the scalp.	Make up freshly once a week.
	Stelwagon.
R—Chrysarobini,	
Ichthyolis	āā gr. lxxv
Acidi salicylici	gr. xlv
Vaselini	3iij—M.
S.—External use.	Unna.

RINGWORM.

Up to within a comparatively recent period it was believed that ringworm in its various manifestations was due to a special fungus, the *Trichophyton tonsurans*, and that the clinical differences were the result of variations in regard to the luxuriance of its growth and the susceptibility of the skin, the point of attack, etc. It is impossible here to enter at all minutely into this question, but it suffices to say that since Sabouraud's researches in 1894, the plurality of the fungi in ringworm has been very generally admitted. He declares that the ringworm encountered in human subjects comprises two affections caused by fungi as distinct from each other in every way as those of favus or tinea versicolor. The following divisions are now usually recognized:

1. Tinea of Gruby and Sabouraud, or common tinea; tinea with small spores due to the *Microsporon audouini*.

2. Trichophytic tinea, or tinea with large spores due to the various forms of *Trichophyton megalosporon*.

There are two varieties of the large-spored fungus, the endothrix and the ectothrix, which are again divided into several subspecies.

Ringworm exhibits considerable diversity of clinical appearance according to the parts attacked, and, as is now taught, the lesional expression will vary according to the species of fungus present. Necessarily, also, the matter of treatment will in a measure depend upon the part of the body invaded.

Ringworm of the Scalp. Description.—Since the demonstration of the plurality of the fungi in ringworm was established, it has been shown that the clinical appearances will depend upon the source of the infection. In ringworm of the scalp due to the small-spore tinea (*Microsporon audouini*) there may be one or several patches, varying in size, round or oval and distinctly circumscribed. Sometimes there is one large patch with outlying satellites. In young children there may be a hyperemic ring at the circumference. The mouths of the follicles are sometimes slightly raised, making the lesion look like the skin of a plucked fowl. The patches are not bald, but covered with stumps about one-eighth inch in length, the stumps being surrounded at their bases by whitish sheaths or collarettes, which, lying close together over the diseased areas, give the skin its powdery aspect. The hairs are pale and lustreless, usually lie all in one direction, and readily break off, and as the majority of hairs are affected, the patch has the appearance of a cornfield covered with the stubble of broken, bent, and frayed-out stalks. The patch or patches may be scaly or not, but the skin is usually unaltered unless there is a complicating seborrhea.

Aldersmith states that, quite rarely, he has seen the places get quite bald, even with club-shaped stumps, closely simulating alopecia areata. Sometimes there is a certain amount of eczema with crusting of a seborrheal type. Contrary to Sabouraud's original statement, several authorities state that the small-spore tinea may, exceptionally, cause pustules and even the kerion type. The *microsporon* may also produce small, scaly places on the body, that is, the neck, face, and shoulders, and also red, raised rings about three-quarters of an inch in diameter or even larger (Adamson). The majority of cases of ringworm of the scalp observed in this country are due to the small-spore fungus.

Large-spore tinea of the endothrix variety produces on the scalp certain appearances that differ somewhat from the conditions just described. The skin in the affected

areas is usually cleaner and smoother, and it is said that the patches are smaller.

Black-dot ringworm in which the hairs are broken off at the mouth of the follicle, and in which the patches suggest alopecia areata, is due to the endothrix fungus.

The ectothrix produces, as a rule, single lesions, though from auto-inoculation others will form later on. The clinical characters are diverse, such as dermatitis, impetigo, folliculitis, discrete or conglomerate, kerion, etc. There may be swollen glands and some febrile reaction. According to Fox and Blaxall the hairs are less eroded and broken up than in other forms, and it is sometimes difficult to detect an obviously diseased stump, or even traces of the fungus.

Kerion is really an acute folliculitis in which arises a circumscribed, boggy swelling studded over with gaping follicles that pour out a sticky, honey-like secretion. Suppuration is exceedingly rare, but the hairs fall out and leave exposed a red patch that after awhile becomes normal. Sabouraud holds that this condition is always due to the ectothrix fungus, but the English authorities state that it also occurs with the microsporon.

Diagnosis.—The essential feature in the diagnosis of *tinea tonsurans* is the discovery of scaly, circular patches on the scalp in which the hairs are broken off, dry, brittle, and variously distorted. Even in the disseminated cases the stumps are usually sufficiently characteristic. However, as all cases are unfortunately not typical, it will be found that the following diseases sometimes simulate ringworm, viz., eczema, seborrhea, psoriasis, alopecia areata, and certain pustular affections.

In all doubtful cases the microscope should be brought into requisition. For purposes of examination the scales or hairs may be moistened with liquor potassæ and observed with a power of from 300 to 500 diameters.

Prognosis.—The prognosis will naturally depend in a degree upon the extent and chronicity of the ringworm, as well as upon the variety of fungus present in a given case.

Until recently, a cure was not to be expected in new cases in less than two to four months; while in chronic cases, from one to two years was usually required. With the modern application of the *x*-rays, however, the time demanded is far more brief, even should we fall short of the brilliant results reported by our Parisian confrères.

Treatment.—The physician's first duty is to prevent the spread of the disease to others. He should insist on examining the other children in the family. If the case be in a boarding school or asylum, all inmates should have their scalps carefully investigated without reckoning time or trouble; isolated stumps and suspicious scaly places receiving special attention. It is not necessary to isolate infected children, but their scalps should be covered with closely fitting caps lined with paraffin paper, which should be changed daily. It is wrong to allow ringworm patients to attend school. As a matter of course combs, brushes, towels, etc., are not to be used in common, and should be frequently disinfected. The disease in the beginning, before the hairs have become seriously affected, is more easily manageable. In all cases, however, as a preliminary step, it is necessary to cut or shave the hair, and to clear it of scales by washing with hot water and soap, preferably the prepared olive soap already mentioned. When there are but few patches, especially with girls, it is only necessary to clip the hair for a space round about the affected area. To prevent dissemination of the disease to other parts the whole scalp may be sponged daily with a 2 per cent. solution of carbolic acid, a saturated solution of boric acid, or, as recommended by Crocker, carbolized oil, 1 in 20. Thin thinks well of a boric acid ointment for this purpose.

It seems to us that there is no objection to washing the scalp every few days with soap and hot water, although this practice is condemned by some practitioners. Morris, for example, says that water should not be used, but that antiseptic washes are permissible. For this purpose he advises a lotion of 10 gr. of salicylic acid to 1 oz. of ether

or chloroform. There is also considerable difference of opinion as to the value of epilation, but it must be admitted that the practice is insisted upon by physicians of the highest authority.

Aldersmith recommends epilation if the ringworm be recent, and if there be only a few places. It is also especially useful, he states, in the *Megalosporon endothrix*, resistant variety, and in the *ectothrix* form. Morris advises that not only the visibly diseased hairs be removed, but that a ring of sound hair around the patch should be plucked out.

The immediate medicinal treatment consists in the local application of various substances, combined in a variety of ways, and of strengths suitable to the case in hand. Unfortunately for the practitioner of little experience in ringworm, the number of agents employed is so great that a choice of remedies becomes a matter of considerable difficulty. Although in ringworm of the scalp it is always best to select a given remedy and persevere with its application, it must be borne in mind that all cases cannot be treated alike, and it will be convenient to have at command more than one resource. The remedy employed must be selected with reference to the age of the patient, the stage of the disease, and also to its dissemination on the scalp.

In young children, that is, under a year, the disease will generally yield to an ointment of sulphur of the strength of 1 drachm to 1 oz. of lanolin, lard, or vaselin.

R—Sulphuris præcipitati	3j
Ung. aquæ rosæ	3ij
Lanolini	3vj—M.

S.—Apply night and morning.

Recent cases occurring in older children may often be quickly cured by more decided stimulating remedies.

English physicians speak highly of Coster's paint (2 drachms of iodine and 5 drachms of colorless oil of wood tar). It may be painted on with a stiff brush every four or five days. Simple painting with the tincture of iodine and blistering with the acetic cantharidal collodion are also

useful. In more chronic ringworm, the oleate of copper, varying in strength from $\frac{1}{2}$ drachm to 4 drachms to 1 oz., is very serviceable (Shoemaker, Weir).

Salicylic acid, from 1 scruple to 1 drachm, and sulphur from 1 to 2 drachms to 1 oz., make a valuable combination. The oleate of mercury, 5 to 20 per cent., and carbolic acid, 20 to 60 gr. to 1 oz. of glycerin, or in ointment, are to be recommended. Bichloride of mercury, 2 to 4 gr. to 1 oz., if used cautiously and not over too large a surface, is one of the most efficacious remedies.

All of the mercurial preparations do good, such as the citrine ointment, the white precipitate ointment, etc.

Chrysarobin is regarded by Duhring, Morris, Stelwagon, and others as one of the most valuable agents in the treatment of ringworm. It may be employed as an ointment in strength varying from 10 gr. to 2 drachms to 1 oz. of excipient. It must be applied with great caution, since it is capable of setting up a severe dermatitis. Care must be taken to wipe off the excess, and to have the patch protected with rubber tissue held in place by a cap. Hutchinson recommends the following formula:

R—Chrysarobini	3j
Hydrarg. ammoniati	gr. xx
Liq. carbonis deterg.	℥x
Lanolini	3j
Adipis recentis	3vj—M.

Unna combines it with ichthyol and salicylic acid:

R—Chrysarobini	gr. lxxv
Acidi salicylici	3ss
Ichthyolis	gr. lxxv
Ung. simplicis	3ijj—M.

R—Chrysarobini	gr. xx—3j
Acidi salicylici	gr. xx—3j
Olei amygdalæ	3ij
Lanolini	q. s. ad 3j—M.

Aldersmith.

Chrysarobin dissolved in chloroform (Aldersmith) or made into a paint with traumaticine or collodion (Alexander) is sometimes successful. Cavafy's lotion is made as follows:

R—Acidi borici	3j
Ætheris sulphurici	3j
Alcoholis	3iv—M.

S.—Rub in with a sponge two or three times a day. Wash the head daily with warm water and soap.

Aldersmith says that salicylic acid is an excellent remedy both for small spots and extensive forms of ringworm.

R—Acidi salicylici	gr. x-xxx
Ætheris	3ij
Spiritus rectificatum	ad 3j—M.

Salicylic acid may be also combined with sulphur.

R—Acidi salicylici	3j
Sulphuris præcipitati	3jss
Vaselini	3j
Olei limonis	q. s.—M.

The following method recommended by Crocker has given good results in our hands. The patches, as well as a surrounding strip one-half inch wide, are closely shaven, after which they are painted with collodion containing salicylic acid, 1 to 30. Fresh collodion is applied every day for a week. The dried collodion is then lifted off by inserting a spatula under its edge, and the process repeated until a cure is effected.

Startin's ointment, quoted by Duhring, is often very useful.

R—Sulphuris sublimati	3ss
Hydrarg. ammoniati	gr. x
Hydrarg. sulphureti nigri	gr. x
Misce et adde:	
Oleum olivæ	3ij
Creosotum	gtt. iv
Adipem	3vj—M.

In very rebellious patches the surface may be painted occasionally, the effect being watched, with glacial acetic acid, employing in the intervals a mild parasiticide like sulphur ointment. Another form of treatment for inveterate cases is by the use of croton oil. This method has both friends and enemies. Thin and many others condemn it outright, while Aldersmith, its especial advocate, and

Cottle and Crocker look upon this procedure, when properly done in selected cases, as of considerable value. Crocker's opinion on this question is of especial importance. This conservative and experienced observer says that the croton-oil treatment is a certain method for chronic cases of limited extent, and for the isolated diseased hairs and those in small groups in disseminated ringworm. Croton oil should not be applied in the cases of scrofulous children, or in those under six years of age. In limited patches Crocker makes use of a liniment of 1 part of croton oil to 10 of olive oil. While there may be some question as to the advisability of using the croton oil over even so limited an area as one-half square inch, we can see no objection to its employment in those cases displaying isolated stumps and black dots here and there over the scalp. For this purpose one drop of oil may be introduced into the follicle by means of a specially devised needle. In a short while a pustule forms and the hair comes away.¹

Electrolysis of single follicles is of especial value, but it must be remembered that these destructive methods produce alopecia, and consequently are only indicated for isolated stumps.

Judging from the recent expressions of opinion on the subject, the treatment of ringworm by formalin is not to be recommended. It is very painful and causes considerable local reaction.

The condition known as kerion requires only a soothing treatment, which may be made mildly antiparasitic. The tumor should not be opened, however suggestive of abscess it may be.

The treatment of ringworm should be kept up as long as there are any clinical evidences of the disease apparent, viz., the presence of characteristic stumps and abnormal desquamation; but this sort of evidence must be supplemented from time to time by microscopic examination.

¹ For details in the use of this method see Aldersmith's valuable treatise on ringworm. He still maintains its great value in suitable cases if done with proper precautions.

The value of the **x-rays** for the production of epilation in parasitic disease rests on quite other grounds than is the case in hypertrichosis, for here we neither need nor desire a permanent alopecia, and, therefore, do not push the treatment to the point of producing atrophy. Besides, while the epilating effects of the rays on the face are slow and disappointing, on the scalp, a region oftener attacked by the trichomycoses, they are rapid and satisfactory. It has long been recognized that epilation is the *sine qua non* of success in the treatment of these diseases. Not only, however, was the process slow and painful by all former methods, but often ineffectual, inasmuch as a portion of the spore-laden hair was left behind in the follicle. In the **x-rays** we have at last the desired agent—painless, rapid, and efficient.

We must be careful, however, not to overstep the mark and produce a permanent alopecia. Sabouraud gives a simple formula: tube distance, 6 inches; penetration, No. 4, Benoist; quantity, 4 or 5 H; one sitting of twenty-five minutes' duration. The equivalent spark with a coil is only $2\frac{1}{2}$ cm. long. Depilation begins fifteen to twenty days later. If there are several patches, the above dosage is to be applied to each one. Where the whole or a large part of the scalp is involved, the matter becomes more complicated, as it is essential to leave no hairs between the areas separately treated. These hairs would soon reinfect the portions cured. Of course, in the latter class of cases the treatment must be prolonged over several or many sittings. If there be no more than five patches, each patch is painted with tincture of iodine, going 1 cm. beyond the diseased area, and separately treated. If the number of patches be greater, the whole scalp is divided into 6 parts and each separately treated. In any case all parts not immediately under treatment are carefully shielded. After exposure Sabouraud uses daily washing with soap, followed by friction of the whole scalp with a mixture of 1 part tincture of iodine to 5 of alcohol. This not only helps in dislodging loosened hairs, but serves to prevent reinfection. The

danger of this accident lies in the fact that the spores in the cast-off hairs retain their full activity, the beneficent action of the rays being limited to dislodging the hair unbroken from its follicle. One sitting generally suffices to a cure of a single patch.

ADDITIONAL PRESCRIPTIONS.

R—Hydrarg. iodidi rubri gr. iv-vj
 Sodii iodidi ʒss
 Spt. chloroformi ʒij-ʒiv
 Aquam ad ʒj—M.
 S.—To be applied to small places. Aldersmith.

R—Sulphur. sublimat. gr. iij
 Acidi carbolic ʒ xx
 Lanolini,
 Olei olivæ āā ʒij—M.
 Morris.

R—Sulphuris præcipitati ʒj
 Hydrarg. ammoniati ʒss
 Thymolis gr. x
 Vaselini ʒj
 Ung. simplicis q. s. ad ʒj—M.
 S.—Dissolve the thymol in the vaselin by aid of heat.

Jamieson.

R—Sulphuris præcip. ʒj-ʒjss
 Acidi salicylici gr. xv-xxx
 Adipem benzoatum ad ʒj—M.

S.—To be rubbed in over the whole scalp once a day directly after washing. Some stronger parasiticide to be applied to the patches.

Aldersmith.

Ringworm of the Body, or Tinea Circinata. Description.—The common sites of eruption are the face, neck, and the backs of the hands, although other parts are not infrequently affected. As stated above, it is not uncommon to find small, scaly patches on the necks and faces of children suffering from the small-spore ringworm of the scalp. In another variety of the disease due either to the endothrix or microsporon fungus the first evidence of the disorder is a scaly, erythematous spot that spreads peripherally. The outer raised border is usually papular and shows more desquamation than the centre of the patch.

Meantime the lesion goes on increasing in size, sometimes to the diameter of a silver dollar, or even of the palm of the hand, but simultaneously the patch clears up in the middle, and in this way ring-forms are produced. In some instances the margins of the patches are distinctly papular or vesicular. When several rings are situated near each other they may join and in this manner give rise to irregular gyrate lines; or, rarely, several rings, one within the other, may be developed.

At times, ringworm of the body occurs as merely scaly, generally rounded, eczematous-looking patches.

The fungus is sometimes found on the palms and soles, and may also invade the mucous outlets. The nails may be invaded by the parasite, becoming brittle, opaque, and often longitudinally furrowed.

When the fungus finds a lodgement in parts of the body where skin surfaces are in contact, the concomitant conditions of heat and moisture seem to furnish more favorable soil for its growth, and as a consequence the symptoms that are set up are more violent and obstinate. Under these circumstances the disease is encountered in the axillæ, and more especially on the thigh, where, owing to the characters that it assumed, the disorder was called *eczema marginatum* by Hebra. From the latter situation it may spread to some extent down the thighs and over the buttocks, and lower part of the abdomen. Although the parts may look as if affected by an ordinary eczema, the outer border will be abrupt, papular, sometimes vesicular and clearly defined against the outlying skin.

It is now recognized that the affection called "agminate folliculitis" is in reality ringworm. The lesions, which consist of raised patches of various sizes, studded with small pustules, are red and edematous, and attended with some itching and burning. In other types the disturbance is more profound, and resembles in a measure a kerion of the scalp. The forearm, back of the hand, and the buttocks are said to be the usual sites of attack. This form is due to the *ectothrix* fungus and is of animal origin.

Diagnosis.—It is not always an easy matter to demonstrate the trichophyton microscopically. For this purpose a few scales may be taken from the periphery of a patch and moistened with liquor potassæ, and under a power of several hundred diameters, both mycelia and spores may be detected, but as a rule in scant quantity. The clinical diagnosis is more immediately important.

It is to be distinguished from syphilis, eczema, psoriasis, and seborrhea.

Prognosis.—The prognosis is favorable. Eczema marginatum is somewhat more obstinate, but a satisfactory result may be obtained with the exercise of ordinary patience and skill.

Treatment.—The treatment for ringworm of the general surface is usually simple and effectual. A few paintings with tincture of iodine, after washing with soap and water, will often suffice. Among other remedies may be mentioned an ointment of salicylic acid (20 gr.) and sulphur (1 drachm to 1 oz. of vaselin; white precipitate, 30 or 40 gr. to 1 oz.; corrosive sublimate, 2 gr. to 1 oz. of water or alcohol; hyposulphite of sodium, 60 gr. to 1 oz. of vaselin or water); in fact, any of the usual parasitocides. In the so-called eczema marginatum, Taylor recommends 2 to 4 gr. of corrosive sublimate to 1 oz. of tincture of benzoin. Bulkley extols the fresh sulphurous acid. In obstinate cases modified Wilkinson's ointment is quite valuable. Rosenthal's paste is also useful. We think it is better to avoid chrysarobin preparations in this locality for fear of undue irritation. After proper scraping and paring, similar remedies may be applied to the nails when affected.

Dubreuilh in **onychomycosis** smears the nails twice daily with equal parts of pyrogallic acid and olive oil. It produces acute inflammation and the discharge of the nail. Sabouraud uses a solution of iodine, 15 gr.; potassium iodide, 30 gr.; water, 1 quart. Absorbent cotton is soaked in this solution and applied to the nails under a rubber stall. It is certainly a more agreeable method than the production of a paronychia.

Harrison's method is highly recommended by British writers. The nail is first scraped and then solution No. 1 (R—Liq. potassæ, aquæ, āā ℥ss; potassii iodidi, ℥ss) is applied by means of lint covered with oiled silk, and allowed to remain in place fifteen minutes; then solution No. 2 (R—Hydrarg. bichlor., gr. iv; alcoholis, aquæ, āā ℥ss) is immediately put on, following the same procedure, and allowed to remain in place for twenty-four hours.

ADDITIONAL PRESCRIPTIONS.

R—Creosoti	℥xx
Olei cadini,	
Sulphuris sublimati	āā ℥ij
Potassii bicarb.	℥j
Adipis	℥j—M.
S.—External use.	Tilbury Fox.
R—Resorcini	gr. x-xv
Sulphur. præcip.,	
Zinci oxidi	āā ℥ss
Vaselini	℥j—M.
S.—For ringworm of the general surface.	
R—Acidi salicylici	gr. xx
Collodii flex.	℥j—M.
S.—Paint on eruption.	
R—Hydrarg. ammoniati	gr. iij
Adipis	℥j—M.
S.—Local use. For young children.	Morris.

Ringworm of the Beard. Description.—*Tinea barbæ*, *tinea sycosis*, *sycosis parasitica*, barber's itch, or ringworm of the beard is a form of acute inflammation of the hair follicles of the hairy parts of the face or neck, and is due according to Sabouraud to the *ectothrix fungus*.

Tinea sycosis begins much in the same way that a ringworm does elsewhere, that is to say, as a reddish, circular, slightly scaly, and somewhat itchy patch. Such a patch may be flat or raised at the outer border, and occasionally show a few papules or vesicopustules. One or more lesions may be present. This superficial form of the disorder is the more common, and differs but little in

appearance from *tinea tonsurans*. The moustache is rarely invaded, but the chin, submaxillary regions, and the neck are usually affected.

Sometimes the mild or pityriasic form spontaneously recovers, or is readily cured, the soil being unfavorable to the growth of the fungus; but under other circumstances, in untreated, neglected or particularly susceptible cases, or, perhaps, from the nature of the fungus itself, the disease extends, the parasite attacks the follicles, with the result of inducing follicular and perifollicular inflammation, and the consequent formation of deep-seated nodules, that often run together to make more or less extensive, lumpy patches. Much pain and burning is often experienced, especially in acutely developed cases, and the parts present a deep-red or purple appearance.

The hairs either fall out over the affected areas or may be extracted with great ease, and from the follicular opening a mucoid secretion is poured out, as in kerion. Often pustulation is a marked feature, and numerous crusts form, which upon removal exhibit an uneven, raspberry-like surface. One or more nodules may be present, or occupy circumscribed regions, or the whole surface of the neck and chin may be invaded. Permanent alopecia may result from destruction of the hair follicle. The disease is apt to pursue a chronic course.

Sabouraud insists that the parasite is always of animal origin. As the disease is less frequent in men who wear beards or shave themselves, it is likely that the barber and his utensils are, to a certain extent, carriers of the infection. Aldersmith says that he has never known the fathers of children with common scalp ringworm to get parasitic sycosis from them. Bulkley, on the other hand, states that clinical experience shows that this disease is constantly contracted from, and again produces in others, the ordinary forms of ringworm of the body and scalp.

Diagnosis.—The characteristic features of the disease are, in the mild form, the presence of one or more circular, scaly patches in the region of the beard, with or without a

raised margin, which sometimes clear in the centre, leaving a ringed border; in the severe form there occur acute folliculitis, indurated nodules, and brawny, deep-seated infiltrations from which the hairs have fallen out or may be painlessly extracted, showing, besides, either a crusted surface or exhibiting a sticky, mucoid secretion. *Tinea sycosis* is to be differentiated from simple *sycosis*, *eczema*, and certain forms of syphilis. In all cases of doubt microscopic examinations should be made.

Prognosis.—Untreated cases run on indefinitely; but, if promptly and energetically treated, a favorable result may be expected; in fact, it is a much more tractable affection than ringworm of the scalp.

Treatment.—In the early and superficial stage, the disease may be cured without great difficulty. Often the application of the sulphur and salicylic acid ointment, or an ointment of white precipitate (30 gr.) and the liquor carbonis detergens, 1 drachm to 1 oz., is quite sufficient. A more elegant and cleanly method is the application of the bichloride of mercury (2 to 4 gr.) in 1 oz. of tincture of benzoin (Taylor) or the same in water or alcohol. Ihle praises resorcin (*R*—Resorcini, \mathfrak{Z} ijss; vaselini, \mathfrak{Z} jss; zinci oxidi, amyli, $\mathfrak{a}\mathfrak{a}$ \mathfrak{Z} vj—*M*.).

In the deep or kerion-like form it is necessary to remove crusts, to shave, and, as the hairs are readily extracted, to epilate. The crusts are best removed by applying the unguentum vaselini plumbicum spread on cloths, which also, at the same time, soothes the inflamed surfaces. Although, as a rule, it is altogether unnecessary to open the nodules, occasionally much comfort is secured by free incisions. After the acuteness of the attack has worn away somewhat, it is advisable to begin the use of parasiticides. Sulphur and tar, mercury, sulphur and salicylic acid, the oleate of copper, and the hyposulphite of sodium in ointment or lotion are all efficient:

<i>R</i> —Sodii hyposulphitis	\mathfrak{Z} iv
Aquæ destillatæ	\mathfrak{Z} iv— <i>M</i> .
S.—Mop on affected parts three or four times a day.	

R—Acidi carbolicæ ʒj
 Sulphuris præcipitati ʒj
 Vaselini ʒj—M.
 S.—Apply twice a day.

Shaving should be kept up daily, or at any rate every other day, for some months after apparent cure.

The x-ray treatment is similar to that used in tinea tonsurans, except that one need proceed with more caution. A raying which would be well borne by the scalp would probably provoke a severe inflammation of the face.

ADDITIONAL PRESCRIPTIONS.

R—Acidi carbolicæ gr. v-x
 Acidi tannici pulv. ʒss
 Glycerit. tannini ʒss
 Sulphur. præcip. ʒss-ʒij
 Ung. aquæ rosæ ʒj—M.
 S.—External use. Bulkley.
 R—Naphtholis ʒj
 Saponis viridis,
 Cretæ præp.,
 Sulphuris præcip.,
 Lanolini aa ʒvj—M.
 S.—Apply at bedtime. Morris.

TINEA IMBRICATA.

Description.—This fungus disease is found in the Malay Archipelago and certain of the Pacific islands. The disorder may attack any part of the body, but usually avoids the scalp and other hairy parts. It is contagious and develops about nine days after a primary inoculation. "The disease begins with inflamed circular patches, which extend, coalescing with neighboring patches, becomes scaly and very itchy, and, ultimately, unless its progress is arrested by treatment, the whole surface of the body becomes affected. The scales are arranged in concentric circles, in spirals or in irregular curves about one-quarter of an inch apart. The scales stand out free, being only attached by one edge to the skin."

Treatment.—The treatment is essentially that of ring-worm. Thos. W. Jackson¹ says that a strong solution of salicylic acid in alcohol is effective, but painful. He also recommends citrine ointment.

TINEA VERSICOLOR.

Description.—*Tinea versicolor*, or pityriasis versicolor, is a vegetable parasitic disease due to the microsporon furfur. It attacks adults and appears on the trunk in the form of large and small, slightly scaly patches of a fawn color. It is a very common affection, probably occurring much more frequently than the statistics would indicate.

It is rarely met with on the face or scalp² and never occurs on the hands or feet, being limited to the front and back of the chest, the covered part of the neck, the arms, the axillæ, and groins.

It begins as small, round spots or points that gradually enlarge, and finally, by coalescence and the continuous development of new lesions, large sheets of eruption may be formed. The spots may, however, remain discrete, and even where large patches have appeared, smaller spots are to be seen beyond and between them, as well as on other portions of the trunk. The patches are but slightly elevated, and are usually the seat of a fine desquamation, or, if the scaling is not well developed, it can be made more apparent by scraping the surface with the finger-nail or a dull knife. The color has been well described as fawn or light brown, although under certain circumstances the patches may be dark brown, or, rarely, almost black. Itching is not a marked feature. The disease when allowed to go untreated may continue indefinitely. Although a vegetable parasitic disease, it is but feebly contagious.

¹ Tropical Medicine, P. Blakiston's Son and Co., Philadelphia, 1907.

² Biart reports a case of *tinea versicolor* of the face, and Payne records the disease on the scalp.

Tinea versicolor is due to the *Microsporon furfur*, which invades the superficial layers of the epidermis only.

Examined under the microscope, after moistening the scales with liquor potassæ, this parasite is seen to consist of round spores of a uniform size, which are arranged in masses like bunches of grapes. The spores are joined by interlacing mycelia. The arrangement of the spores in groups is quite distinctive.

Etiology.—*Tinea versicolor* is a disease of adult life, although occasionally observed in children. We once saw the disease in a child of eleven years who wore a plaster jacket. The father of this child also was affected. The idea that the disorder is more frequent in consumptives is probably due to the fact that it is more commonly observed in them from the necessity of uncovering the chest for physical examination, and, perhaps, also to their great tendency to sweating, a condition favorable to the development of the fungus. It may not be amiss to state that *tinea versicolor* has nothing in common with syphilis or derangement of the liver.

Diagnosis.—The recognition of the disease is without difficulty if the clinical symptoms are remembered, and in case of doubt the microscope will readily settle the question.

Chloasma, the affection that it most resembles superficially, does not, however, occur on the trunk, but on the face. *Seborrhea* of the trunk, *pityriasis rosea*, the erythematous syphiloderm, and *erythrasma* should be excluded in making the diagnosis.

Prognosis.—The temporary removal of the eruption is more or less readily accomplished, but relapse of the disease is to be expected in the course of time.

Treatment.—The treatment consists in washing the parts night and morning with green soap and warm water, and afterward the free application of the following lotion:

Rj—Sodii hyposulphitis	. . . . .	3vj
Aquæ destillatæ	. . . . .	3iv—M.
S.—Local use.		

In many cases washing the surface night and morning with a superfatted soap of sulphur, camphor, and balsam of Peru soon causes the trouble to disappear.

In obstinate cases several baths a week of the hyposulphite of sodium— $\frac{1}{2}$ pound to 30 gallons of water—helps on the cure. An ointment of sulphur and salicylic acid—1 scruple of the first and 1 to 2 drachms of the latter—is equally efficacious. Disinfecting the underclothing, as suggested by Taylor, undoubtedly prevents reinfection.

ERYTHRASMA.

Description.—This slight affection, first described a number of years ago by Burchardt, and later by Bärensprung, has been made the subject of further study in recent years by Balzer, Riehl, Behrend, and others. It occurs in situations where the skin is in contact, *e. g.*, folds of axillæ, cleft of nates, and in the inguinal and genitocrural regions—and consists of variously sized, slightly furfuraceous patches of a light-red color, which later become yellowish, reddish, or brownish. Occasionally the patches may cover large surfaces (Besnier). It is chronic in its course, and gives rise to no especial subjective sensations. It is generally agreed that the disease is due to a parasite first called by Bärensprung the *Microsporon minutissimum*.

Prognosis.—The disease is altogether a trivial one and readily removed by treatment, although there is a liability to relapses.

Treatment.—The treatment is the same as for tinea versicolor. The following ointment rubbed in twice a day generally suffices:

R—Acidi salicylici	ʒj
Sulphuris præcipitati	ʒj
Ung. aquæ rosæ	ʒj—M.

S.—For local use

Riehl recommends a $\frac{1}{2}$ per cent. alcoholic solution of corrosive sublimate, and Wilkinson's ointment.

PINTA DISEASE.

Description.—This is a fungus disease, prevalent in tropical America, which produces discolorations of the skin. It is characterized by patches of various shapes and colors, and affects the exposed parts of the body except the palms and soles, but it may invade the entire surface, including the scalp. The color of the lesions varies from a dull white to grayish blue, or red. The patches are covered with a branny desquamation in the beginning, but later the scales are much larger. The hairs turn white and fall out. Ulceration is present in severe forms. Itching is intense and the emanations from the patients very offensive. The disease is very chronic, but spreads slowly. It occurs at all ages, and attacks, by preference, persons in the lower walks of life. It is generally supposed to be contagious.

Treatment.—The treatment is by the application of antiparasitic remedies.

MYCETOMA.

Description.—Mycetoma, Madura foot, or podalcoma, is a disease found principally in India, though cases have been reported in this country.¹ There are three varieties of the malady, which are known as the black, the white, and the red. The disease attacks generally the foot, though the hand and scrotum may be affected. The first evidence of the affection is a vesicle, pustule, papule, hard nodule, or a black mottling of the skin like tattoo-marks. After a time a sinus forms which discharges pus, whitish bodies, and then black masses resembling fish roe. In a fully developed case the foot is much distorted, the arch broken down, and the whole foot studded with nodules representing the orifices of sinuses. About the sinuses are scattered black granules

¹ Hyde, *Journal of Cutaneous and Genito-urinary Diseases*, January, 1896.

in the skin. The discharge of the roe-like masses from the sinuses is the most characteristic sign of the disease. These masses contain a ray fungus very similar to the actinomycosis fungus, although not identical and staining differently.

Madura foot runs a very chronic course, but is not usually dangerous to life.

Treatment.—Complete removal of the diseased tissue seems to be the only successful treatment. When the disease is superficial, scraping with the sharp spoon may accomplish this. If only a toe or a finger is involved, it should be amputated. If the disease is advanced, only the removal of the limb well above the affected area will suffice.

ACTINOMYCOSIS.

Description.—Actinomycosis of the skin is a very rare affection. It usually develops as secondary to a deposit of actinomyces in the deeper tissues. The disease is most common in the neck and about the lower jaw. Over an indolent, hard swelling the skin becomes thinned, red, and eventually gives way, discharging pus which may contain the characteristic yellow, pin-head-sized granules. In this form the disease very much resembles what is seen in tuberculous glands. When a sinus has thus formed there may appear about the opening nodules of a reddish or bluish hue, which may suppurate.

Actinomycosis generally arises by the fungus gaining access to the body through a carious tooth, and this explains why it is so commonly seen about the neck and jaw. It has been observed to attack other parts of the body.

The **cause** of the disease is the ray fungus, which is easily discovered by the microscope in the granules mentioned above.

Actinomycosis is usually acquired from animals, but it is possible that it may be got by handling straw or grain.

The disease may have an incubation period of months or years.

The only way to make a positive diagnosis of actinomycosis is to find the fungus.

Treatment.—It was formerly thought that the prognosis in actinomycosis was invariably bad. On this account the most serious operations were readily undertaken. More recent observations have shown that a large proportion of the cases live many years, and some recover spontaneously, so that severe operations are looked upon with disfavor. When possible, sinuses and abscesses should be thoroughly laid open, and, after curetting, washed with a solution of bichloride of mercury. Gautier cured a case by liberating nascent iodine in the tissues by injecting solutions of iodide of potassium, and then passing a galvanic current by needles introduced into the tissues.

The iodide of potassium in tolerably large doses internally should always be faithfully tried. Rydygier and others have reported favorably on parenchymatous local injections. Bevan gives copper sulphate in $\frac{1}{4}$ -gr. doses, three times a day. Stelwagon has found the x-rays of value.

Pusey believes there is every reason to use the rays in conjunction with potassium iodide. So far, however, results have on the whole been unconvincing.

Phototherapy has occasionally been of use in the late stage.

ANIMAL PARASITIC AFFECTIONS.

SCABIES.

Description.—Scabies, or the itch, is a contagious disease of the skin induced by the presence of an animal parasite, the *Acarus scabiei*. The affection is very common among the poorer classes in Europe. In recent years scabies has greatly increased in this country.

The lesions seen in scabies are cuniculi, or burrows, papules, vesicles, pustules, and various secondary effects of scratching, such as crusts, excoriations, furuncles, etc. It will, therefore, be noted that the symptoms arise directly from the inroads of the itch mite in the first place, and, secondly, from the traumatisms inflicted on the skin by the patient himself. The chief subjective symptom is intolerable itching, which is noted to be greatly aggravated after the patient retires to bed. It must not be supposed, however, that all cases of scabies present the same symptoms, since these will depend to a great extent upon the age, habits, and, perhaps, susceptibility of the infected person.

The burrows are by no means always to be detected, and in many cases cannot be made out at all. They are best seen on the penis, navel, sides of the fingers, and wrists, and also on the feet of children. A dark spot may be noted at the entrance to the burrow, the acarus lying at the other end, sometimes enclosed in a minute vesicle. The **localization** of scabies is characteristic. In a general way it may be said that the itch insect seeks those parts of the body that offer the most warmth and moisture. In the adult male the acarus attacks the skin between the fingers and over the flexor surfaces of the wrists, the buttocks, the lower part of the abdomen, and the region about the internal malleoli, and especially the penis. In women the **breasts** are involved. The face and scalp are never attacked in grown persons, but the faces of infants at the breast may be invaded. Children are also apt to show the disease on the feet and buttocks, particularly.

The inflammatory lesions of scabies are often multiform, that is to say, papular, vesicular, pustular, and in prolonged or severe cases various secondary changes may be present at one and the same time. On the contrary, however, the disorder may be so mild that a few papules and vesicles only are present. The lesions are irregularly scattered, and do not form groups.

The disease is a dermatitis or artificial eczema due

directly to contagion, that is, the conveyance of an impregnated female acarus to the skin.

Notwithstanding that under favorable conditions scabies is highly contagious, it is a noteworthy fact that the affection is not conveyed in the ordinary intercourse of life, such as hand shaking; nor do physicians seem to acquire it in the manipulation of affected persons. Sleeping in the same bed, wearing infected clothing, and the like, are the principal agents of propagation. The acarus respects neither age, sex, nor social condition.

Diagnosis.—The diagnosis of scabies is, as a rule, readily made. Absolute certainty can only come from the discovery of the acarus or of its burrow; but as it is often impossible to demonstrate their presence, we are generally obliged to rely on the rational signs of the disease. The localization of the dermatitis is nearly always characteristic, viz., the skin between the fingers, the flexor sides of the wrists, the lower part of the abdomen, the buttocks, the penis in the male, and the breasts in the female. The absence of such a generalized eruption from the face in the adult is always a noteworthy circumstance, and its tolerably definite restriction to the parts mentioned adds greatly to the suspicion. In children this localization is much less strict; the face and the feet may both be affected, while, on the contrary, the disorder may be absent from the hands, and more developed on the trunk and the nates. In children large pustules and even bullæ may be encountered. While the lesions of an eczema are spoken of as being multiform; they are not so in the manner seen in scabies; that is to say, they are not seen as a discrete, widely spread eruption of papules, vesicles, pustules, etc. Pediculosis corporis is found on the covered portions of the body, especially on the upper part of the trunk, and the lesions are altogether dissimilar. Finally, the evidence of contagion taken in connection with the other symptoms is a most important aid in diagnosis.

Prognosis.—Scabies is a perfectly curable disease, provided the treatment be thoroughly carried out, and the proper precautions taken against the risk of reinfection.

Treatment.—The disease is quickly amenable to properly directed treatment. Sulphur in some form is the most satisfactory remedy. The usual plan is to direct the patient to take a hot bath with frictions of green soap, and afterwards to apply the following ointment morning and evening for three days:

R—Sulphuris præcipitati	℥xij
Vaselini	℥vj
Olei rosæ	q. s.—M.

S.—Rub in 1 oz. thoroughly night and morning.

The salve must be well worked into the skin, especially in those parts most covered with the eruption. It is not necessary to apply it to the face. We usually direct that the patient keep on the same underclothes, and sleep in the same sheets, during the course. If the treatment has been completed in the morning the same garments are kept on until night, when a hot, soap bath is again taken, and fresh underclothes put on and the sheets renewed. For perhaps a week longer a small amount of salve may be rubbed in at night, in order to make assurance doubly sure. It is a *sine qua non* of the treatment that the underclothing and sheets be disinfected by boiling. The outer garments should be thoroughly ironed with a hot iron.

Sherwell advises the use of sulphur in powder form. After a bath with soap he directs that one-half teaspoonful of the flowers of sulphur be gently rubbed in over the body, and that the same amount be sprinkled between the sheets at bed time. This process may be repeated every two or three days, the cure taking about one week.

A large number of other parasiticides have been recommended. McCall Anderson speaks highly of styrax:

R—Styracis liquidi	℥j
Adipis	℥ij—M.

Duhring recommends balsam of Peru in conjunction with sulphur for scabies in children:

R—Sulphuris sublimati	℥j
Balsami Peruviani	℥ss
Adipis	℥j—M.

Jullien and Descouleurs¹ say that in the treatment of scabies it is sufficient to paint a thin coat of balsam of Peru over the skin and to rub it in gently, a previous soaping not being necessary. The application is made at night, and the next day a bath is taken. The authors claim for this method certainty and simplicity, and assert that it is especially indicated when, for any cause, baths are not indicated. It should be remembered that balsam of Peru sometimes causes toxic symptoms.

Hebra's modification of Wilkinson's ointment is much used abroad:

R—Sulphuris sublimati,	
Olei cadini	āā 3iv
Cretæ præparatæ	3ijss
Saponis viridis,	
Adipis	āā 3j—M.

An ointment of naphthol, chalk, and green soap, as suggested by Kaposi, is very effectual and elegant:

R—Naphtholis	3ss
Saponis viridis	3jss
Cretæ alb. pulv.	3ijss
Adipis	3iiij—M.

If after a course of specific treatment the skin is left inflamed and irritable, it will be necessary to prescribe soothing remedies, although, as a general thing, the cause of the dermatitis having been removed, recovery is speedy. It should be added, however, that in a certain considerable proportion of persons, especially the neurotic, the pruritus remains for weeks and is more difficult to combat than the original disorder. Sometimes this secondary affection, with its accompanying eruption, is strongly suggestive of dermatitis herpetiformis. The treatment consists in the administration of nervines internally and the local application of lotions containing menthol and carbolic acid. (See Pruritus.)

¹ Annales de dermatologie et de syphiligraphie, April, 1896.

ADDITIONAL PRESCRIPTIONS.

R—Styracis liq.	3j
Spt. rectificati	3ij
Olei olivæ	3j—M.
S.—External use. Enough for one person.	Schultze.
R—Sulphuris sublimati	3iv- 3vj
Balsami peruviani	3iv
Beta-naphtholis	3j-3ij
Adipis benzoati,	
Petrolati āā q. s. ad	3iv—M.
	Stelwagon.
R—Balsami peruviani,	
Alcoholis āā	3j—M.
S.—To be painted on with a brush.	Walker.
R—Olei verbenæ	1 part
Gummi tragacanthæ	1 part
Sulphuris præcip.	100 parts
Glycerini	200 parts—M.

S.—First rub patient with green soap, then give an alkaline bath; afterward apply the ointment about the whole body, and then again a bath for twenty minutes. For two weeks following, four baths of starch-water should be given and zinc salve applied if skin is irritable. Sabouraud.

PEDICULOSIS.

Description.—Pediculi, or lice, infest different portions of the human body, and give rise to a contagious affection variously called pediculosis, phtheiriasis, or, in common parlance, lousiness. Three varieties of lice are met with, which differ both in their form and habitat. The symptoms that they occasion really constitute a dermatitis, or artificial eczema, but certain differences in clinical expression will be noted, according to the region invaded.

Pediculosis Capillitii. **Description.**—This is the most frequent form of pediculosis, and is due to the presence of the *Pediculus capitis* or head louse. The pediculi may be present in large or small numbers, and may be detected upon the hair or scalp, but generally, however, the nits are more readily discovered. The occipital region, as affording the two conditions of heat and moisture, is the favored region for the head louse. *Pediculosis capillitii* is more frequent

in children and in women than in the adult male and it is more common in the poorer classes. There is usually much soreness of the scalp, and the irritation set up by the attacks of the pediculi causes scratching which in turn produces the lesions so characteristic of pediculosis in this situation, namely, abrasions and excoriations, a foul, sticky secretion that mats the hair together, and greenish, yellow crusts. The ravages of the pediculi are generally limited to the scalp, but when the hair is long, similar lesions may be seen on the contiguous skin.

A sympathetic enlargement of the occipital glands, as well as of those in front of the ears and at the sides of the neck, is the usual accompaniment of pediculosis capillitii, and in neglected cases suppuration may occur. Even the general health may materially suffer from long-continued nervous erethism and loss of sleep induced by the incessant pruritus. The presence of a pustular eczema in the occipital region, with coincident lymphatic-gland enlargement, occurring in a woman or child, gives rise to a fair presumption that the affection is due to lice.

With a little care the parasites themselves may generally be discovered, and an examination of individual hairs will show the ova, or nits, attached to them near the roots, looking like minute, grayish-white scales. One nit only is, as a rule, attached to a hair, but sometimes a dozen or more may be counted. A nit is to be distinguished from a scale by the fact that the former is glued to the hair on one side and cannot be readily brushed off, while a scale is often pierced by the hair shaft and may be removed without difficulty. The pediculi escape from the ova in from three to nine days, are full grown in about nine days more, and at the end of a similar period are capable of reproduction.

Treatment.—The disorder is readily cured, but a complete and permanent success is only secured by destroying the nits as well as the pediculi. The most effectual plan is to shave off the hair, and apply soothing preparations for the relief of the dermatitis; but as this procedure is not always desirable, it is necessary to employ other measures. If it

is determined not to cut the hair, the physician may order equal parts of petroleum and olive oil, or the petroleum alone, to be rubbed into the hair with white flannel, taking care to keep it from running down on the neck and face, and following up the application next morning with a hot shampoo of soap and water. In order to get rid of the nits, the hair may be washed with vinegar to dissolve the little rings by which they are attached, after which a fine-tooth comb may be employed to detach them.

This latter procedure should be kept up for a week or two. Any local inflammatory symptoms that are left over after the destruction of the pediculi should be treated on general principles.

Pediculosis Corporis. **Description.**—The body or, more accurately, the clothes louse attacks mostly elderly people of the poorer classes, although it should always be remembered that persons of wealth and refinement may be accidentally infected. These pediculi confine their depredations to the body, but they are rarely to be found on the sufferer, since they live in the seams of the undergarments, where their ova are deposited, the skin itself being used as a feeding ground only. The bite of the insect consists of a minute hemorrhagic dot, surrounded by a red areola, which may be effaced by pressure, the central dark speck being, however, left intact. Most of the lesions present are caused by the efforts of the patients to relieve the intolerable itching aroused by the parasite, and are made up of excoriations from the nails, and of a variety of papular, pustular, urticarial, and furuncular eruptions. In long-standing cases the affected regions become deeply pigmented, and covered with scales and crusts. While the eruption may be discovered on various parts of the body, it is mostly to be found on the neck and shoulders.

The **diagnosis** is most certainly fully established by finding the parasite, either on the body, which is rare, or in the seams and folds of the garments; but as clean clothes are often put on just before the physician is consulted, it is necessary to bear in mind the character of the lesions

just described, and especially the location of the eruption about the neck and back.

Treatment.—The treatment should be mainly directed to getting rid of the lice in the clothing. This is best accomplished by long-continued boiling, or by baking in an oven at a temperature of at least 210° F. It is also useful, according to Anderson, to sprinkle some of the powder of staphisagria upon them. This same substance in ointment may be rubbed upon the skin to kill any wandering marauders that may be found there. The patient should be freely scrubbed with soap and water, and afterward the irritable or inflamed skin may be treated as if for eczema. Bed-clothing should also be disinfected. In broken-down subjects, tonics and cod-liver oil are indicated. Jamieson suggests wearing a piece of roll sulphur in a bag.

Pediculosis Pubis. Description.—The pubic louse so called does not invade the head, but is mostly found in the pubic region, as well as sometimes on other parts, namely, the axillæ, the hairy thorax, and even the eyebrows and eyelashes. The lice may be seen as little dark specks attached to the hair near the skin. They attack adults usually, and are most frequently conveyed in sexual intercourse, but by no means always. The irritation caused by the presence of the crab louse is not so violent as with the other varieties, but the itching leads to scratching, and in this way papular and other eczematous lesions are produced. Crab lice often produce a peculiar steel-gray pigmentation (*maculæ cæruleæ*) upon the skin, of the size of the finger-nail or somewhat less, and situated on the inside of the thighs, the pubes, abdomen, and axillæ. The color is thought to be derived from a pigment in the salivary glands of the insect. These spots do not fade upon pressure, but disappear when the pediculi have been destroyed. The classical treatment consists in the free inunction of the blue ointment, but a 10 per cent. oleate of mercury is more cleanly and much less irritating. Sublimite alcohol, 1 to 1000, is still better. Kaposi's petroleum salve—5 parts of petroleum, 2½ parts of olive oil, and 1 part of balsam of Peru—is both elegant

and efficacious. After the remedies have been applied several times a bath may be taken. It is best not to clip or shave the hairs. Mouse-tooth forceps are convenient for pulling the insects off the eyelashes.

ADDITIONAL PRESCRIPTIONS.

R—Hydrarg. bichloridi	gr. ijss
Acid. acetici arom.	℥j—M.
S.—External use.	Regensburger.
R—Pulv. staphisagriæ	℥j
Adipis	℥iv
Digest together for three hours, strain and add	
Oleum staphisagriæ	℥j
Adipem	℥j—M.
S.—External use.	Tilbury Fox.

FILARIA MEDINENSIS.

Description.—The Guinea-worm is a white worm, one-tenth inch in diameter and two to three feet long. It is met with only in tropical countries. The parasite enters the body by the larvæ being swallowed, and not, as was formerly supposed, by the creature boring its way into the tissues from without. The mischief-maker is the female worm, the male never having been discovered. The usual site of the lesions is the skin about the ankles, but it is also met with on the legs and thighs, scrotum, conjunctivæ, under the tongue, etc. Usually, one worm only is present, but sometimes two, or even many more. When the worm has developed to maturity, it tries to make its way into the outer world, and at a circumscribed spot, where for some time has existed an uneasy sensation, the skin will begin to show some signs of irritation. Presently slight fluctuation can be determined. Sometimes violent reaction results, causing phlegmon or even gangrene.

Treatment.—When rupture occurs, the head of the worm will protrude, and its gradual extraction is attempted by winding it around a stick, one inch or more daily, taking

especial pains not to break the body of the parasite during the process. This method is tedious, and has been advised against by Manson, who, with Emily, recommends injecting into the worm as it lies under the skin a 1 to 1000 solution of bichloride of mercury. Christie suggests the electrolytic destruction of the worm. Tincture of asafetida, in 1- or 2-drachm doses, three times a day, has been recommended in addition.

CYSTICEROUS CELLULOSÆ OUTIS.

Description.—The cysticercus of the *Tænia solium* is occasionally found in the subcutaneous tissue, where it forms tumors from pea to marble size, round, and covered by unaltered skin. In the early stages the tumors are tense and elastic, but in time may undergo calcareous change. Usually several tumors are found, more commonly on the back.

Echinococcus cysts have also been found in the skin, where they form fluctuating tumors.

CREEPING ERUPTION.

Description.—This curious malady, due to the invasion of the skin by a minute larva, is not uncommon in southern Russia and adjacent countries.¹ The lesions consist of a red line from one-sixth to one-eighth of an inch in width and just perceptibly elevated. This line extends itself at the rate of one inch or more a day and may traverse a considerable portion of the surface of the body. Its march is sometimes in a straight line, although usually curves and bends are to be noted.

Treatment.—The treatment is by excision or cauterization. Stelwagon applied by cataphoresis a solution of

¹ Cases have been observed in this country by Van Harlingen, Stelwagon, and Shelmire.

2 gr. of mercuric chloride to 1 oz., to an area of one and one-half inches around the advancing end of the burrow, and applied a small drop of nitric acid to the suspected site of the parasite, just beyond the extreme end of the line.

He believes that the high-frequency current would be successful. Cathcart freezes this advancing end of the line or burrow with ethyl chloride, and finds that a single, thorough application suffices to kill the parasite.

Electrolysis would, perhaps, prove useful.

Hutchins suggests the injection, after cocainizing, of 1 or 2 drops of chloroform, pushing the needle along the burrow to the probable site of the grub.

Quite a large number of insects, such as the flea, the mosquito, the tick, bedbug, wasp, bee, etc., attack the human skin and set up more or less dermatitis accompanied by burning, stinging, and itching.

The treatment of the inflammation which results from the bites and stings of insects consists, in the first place, in the removal of the cause, and, secondly, in allaying the burning and itching. For this latter purpose cooling and antipruritic lotions are serviceable, such as cologne, vinegar, weak carbolic acid lotions, and especially menthol in combination with the calamine and zinc lotion:

R—Mentholis	3j-3ij
Alcoholis	q. s.
Zinci oxidi	3ij
Pulv. calaminæ	3ij
Glycerini	3ij
Liq. calcis	q. s. ad 3iv—M.

A pigment of salicylic acid 1 part and flexible collodion 19 parts is a valuable application for the stings of various insects. Pick's linimentum exsiccans with 10 per cent. zinc oxide and 1 per cent. carbolic acid is also an excellent application.

MYIASIS.

Description.—The larvæ of the *œstrus* (bot-fly, gad-fly) and of other *œstrida* are sometimes found in the subcutaneous cellular tissue of man, the ova having been deposited through a puncture in the skin made by the adult female. A boil-like lesion develops at the site occupied by the grub, and soon forms a central aperture through which there discharges a serous fluid, admixed with blood and pus. The worm may burrow for a considerable distance under the skin before exciting much suppuration, in which case there results a sinuous, purplish-red line, clinically much like those seen in lymphangitis. This constitutes the “creeping eruption,” described separately. The condition, rare here, is relatively common in some countries lying to the south of us, and in Russia.

Treatment.—The treatment of the furuncular lesions consists in laying them open, whereupon, the larva may be extruded by lateral pressure.

The *muscidæ* (dung-fly, flesh-fly, etc.) do not penetrate the skin. The larvæ may, however, be deposited in wounds or ulcers or between the folds of skin, presenting a particularly nauseous spectacle. The necessary treatment is sufficiently obvious.

UNCOINARIAL DERMATITIS.

Description.—The Porto Rico Anemia Commission has shown that the hook-worm, in the great majority of cases, invades the organism by way of the skin. 96 per cent. of their patients had had “mazamorra” or ground-itch, “a lesion abundantly shown to be due to the invasion of the healthy skin by these larvæ,” as claimed by Loos, Claude Smith, and others.

Drs. Ashford and King, of the United States army, describe the condition as follows:¹

"Contact of the skin with mud laden with encysted larvæ for a time not necessarily longer than from a few minutes to one-half hour causes first itching, then redness and swelling of the part, with the formation in a couple of days of papules, rapidly becoming vesicles. In favorable cases pustulation does not occur, but when the invasion of many larvæ has profoundly inflamed the part, and the ordinary organisms of pus have obtained a foothold, not only do pustules form, but extensive ulceration may result, which is extremely resistant to treatment."

Treatment.—Prophylaxis may be summed up in the statement "that the well-shod are practically never infected." Treatment should be directed against the pruritus and secondary pus infection. It is said that turpentine is very efficacious if applied early. Ointments of thymol or beta-naphthol naturally suggest themselves in view of the efficaciousness of these remedies in killing the larvæ in the alimentary canal.

¹ Journal of American Medical Association, August 10, 1907, p. 471.

PART II.

GENERAL TREATMENT AND METHODS.

INTERNAL TREATMENT.

THE internal treatment of skin diseases is mainly symptomatic, and, according to the indications present, there may be prescribed, just as for any other bodily disorder, iron, quinine, cod-liver oil, purgatives, stomachics, or diuretics. We may also mention the benefit of lavage of the stomach in rosacea, urticaria, and recurrent eczema of the face.

A large number of the diseases of the skin require local treatment only, a minority constitutional treatment only; perhaps the majority demand a judicious combination of the two. Moreover, in the rational management of cutaneous affections, it is essential that the physician regulate the dietary of his patient intelligently, and that he give him, besides, proper instruction in the details of personal hygiene. As these matters have received the proper amount of attention in the special sections of this book, it will not be necessary to repeat them here. It remains, therefore, to call attention, briefly, to certain internal remedies that are supposed to have a direct or specific effect upon diseases of the skin.

Arsenic.—There is no other article in the *materia medica* more widely, and at the same time, more ignorantly and harmfully used. As a rule, it is contra-indicated in all acute eruptions, and its chief value is in chronic, scaly

affections, psoriasis, lichen planus, and in disorders that are regarded as neurotic, *e. g.*, pemphigus, dermatitis herpetiformis. It is also said to be of advantage in sarcoma and epithelioma. The prolonged administration of arsenic is not devoid of danger, since it may induce neuritis, and, locally, may cause certain epithelial changes such as warty growths and probably the eventual production of epithelioma. Pigmentation following its use is not uncommon. Arsenic may be given in pill or solution, or hypodermically in the form of sodium arsenate. It has not been established that the various other preparations of arsenic such as the cacodylates, etc., have any superiority over the older preparations.

Antimony.—This drug, in the form of the wine, has been somewhat employed of late years in the treatment of acute and subacute inflammatory diseases of the skin, such as eczema, psoriasis, and lichen planus. Duhring states that in small doses it is sometimes of benefit in chronic disorders.

The usual dose is from 3 to 10 minims several times a day. As it is a decided depressant its action should be carefully watched.

Sulphur.—Sulphur once shared with arsenic the reputation of a panacea for all kinds of skin diseases, and, although it is still regarded as invaluable as a local remedy, its internal use has for many years been much neglected. Nevertheless, within certain limits, sulphur given internally is not without considerable value. Crocker regards it most favorably in hyperidrosis. Walker says that it is occasionally useful in erythema multiforme, and we believe that it has a decided value in acne, dystrophies of the nails, and in seborrhea. The sulphide of calcium is given in pustular acne and furunculosis, and Duhring recommends the hyposulphite of sodium in urticaria and furunculosis.

Ichthyol.—Ichthyol contains nearly 15 per cent. of sulphur, but has certain therapeutic properties that are not due to that ingredient. Internally, it is given in urticaria and hyperemic affections of the face.

Quinine.—In urticaria of malarial character quinine may be given with advantage. In large doses it has a decided influence upon pruritus, and it is at times useful in the acute erythemata and in lichen planus. According to Duhring it is valuable in elephantiasis, and by some authorities it is regarded as almost specific in erysipelas.

Salicylic Acid.—Salicin and the salicylates are of extreme value in the erythemata, and, according to Walker, salicylic acid is virtually a specific in erythema nodosum. Salicylate of sodium is useful in general pruritus. Salicin is preferable to the various other combinations of salicylic acid, as it is less irritating and depressing. Crocker recommends salicin highly in lupus erythematosus, psoriasis, lichen planus, and in bullous affections. We concur in the main with his estimate of the drug. The dose advised is 15 gr. three times a day, and this may be increased to 20 or 25 gr.

Phosphorus.—Phosphorus is advised by Bulkley in the treatment of lupus erythematosus, and phosphide of zinc by Ashburton Thompson as serviceable in herpes zoster.

Turpentine.—This drug is recommended by Crocker in uncomplicated cases of eczema and inflammatory cases of psoriasis.

Tar and Carbolic Acid.—Both of these drugs have been given in psoriasis and chronic eczema with asserted advantage. It has also been advised internally for pruritus.

Calcium Chloride.—On theoretical grounds this drug has been recommended by Wright in urticaria. Savill prescribes it in various forms of pruritus, and it is also advised in chilblain and ulcers of the legs. The dose is from 5 to 20 gr. three times a day. It should be given after meals well diluted.

Thyroid Gland.—Thyroid extract is extremely efficacious in myxedema, and has been given with a certain degree of success in psoriasis and ichthyosis, and as an adjuvant in the treatment of lupus and cancer. Small doses should be given at first and the amount increased only gradually. It is much better borne if combined with arsenic.

Suprarenal Extract.—Suprarenal gland has been found of some value in Addison's disease, and it has been suggested in leucoderma and rosacea.

Mercury.—The specific action of mercury in syphilis is fully recognized, but to get the best results from its administration, the state of the patient, the proper dosage, and the proper method of its employment should be duly considered in the individual case. In certain cases of lichen planus mercury apparently has also an almost specific influence. The value of the drug as an alterative in chronic eczema and as an intestinal antiseptic in various skin diseases, notably the eczema of children, may also be mentioned.

Iodides.—Iodine and its compounds are notably of value in syphilis, especially in the later stages, but it also has a decided beneficial effect in actinomycosis and blastomycosis. In very large doses it has been recommended in psoriasis, but we believe that other methods of treatment are safer and speedier. The iodide of starch has been used in lupus erythematosus.

Mineral Waters.—There exists a deeply grounded faith in the efficacy of mineral waters, often of the most diverse chemical characters, in the treatment of skin diseases, but we believe that any favorable influence that they may exert is in no way specific. The aperient and purgative waters are undoubtedly useful when sluggishness of the bowels or constipation exists, and the various alkaline waters are beneficial where an alkaline treatment is indicated. The ferruginous and arsenical waters are at times similarly advantageous. However, it is a fact of experience that these same waters are indubitably more efficacious drunk at the springs, conjoined with change of scene, freedom from care, a regulated dietary, and other well-recognized influences, than when taken at home.

Recent investigations seem to make it probable that the waters of the Hot Springs of Arkansas and certain other noted springs owe their virtues to the presence of radio-activity.

It remains to add that water as such, hot or cold, drunk copiously and at the proper times, is an agent of inestimable value in many morbid conditions of the system.

LOCAL APPLICATIONS.

Powders.—Inert dusting powders are used in dermatological practice to afford mechanical protection as between opposed surfaces and also as absorbents and mild astringents. Such powders may be of either vegetable or animal origin and are represented by rice, starch, arrowroot, lycopodium, zinc oxide, chalk, magnesium carbonate, the infusorial earths, etc. Pautrier states that, generally speaking, mineral powders should be preferred to those of vegetable nature as less liable to change when brought in contact with the cutaneous secretions.

The active powders, such as iodoform, aristol, xeroform, salicylic acid, camphor, alum, calomel, etc., have caustic, reducing, astringent or antipruritic properties according to their composition. Powders are also used in the preparations of pastes.

It is essential that powders should be triturated to extreme fineness and be absolutely without grittiness. As a rule, powders are contra-indicated when there is free discharge.

Powders may be applied with an ordinary powder puff, or, better still, with a pledget of absorbent cotton, or put in little quilted bags, which can be constantly worn. The perforated tin is also a well-known method of dredging a surface with powder.

R—Zinci oxidi 3ij
Pulv. sem. lycopodii 3vj—M.

S.—An absorbent powder.

R—Pulv. amyli 3vj
Zinci oxidi 3jss
Pulv. camphoræ 3ss—M.

S.—An antipruritic powder.

R—Thymolis	gr. j
Pulv. zinci oleatis	3j—M.
S.—An astringent powder.	
R—Xeroformi	3ss
Talci	3ivss—M.
S.—An antiseptic powder.	

Lotions.—Lotions are of great value in the treatment of skin diseases, especially those of a superficial inflammatory type, *e. g.*, urticaria, the erythemata, erythematous and papular eczema, lichen planus, as well as in acne, alopecia, and some of the parasitic affections.

They may be divided into soothing, astringent, antipruritic, stimulating, antiseptic. Pharmaceutically, lotions are weak, medicated solutions or mixtures. Soothing and slightly astringent lotions are perhaps more widely employed than the others, and contain lead, opium, boric acid, bicarbonate of sodium, oxide of zinc, and calamine in suspension, dissolved or mixed in a menstruum of water, water and glycerin, liquor calcis, or liquor calcis and oil of sweet almonds.

Certain of the soothing and astringent lotions holding powders in suspension are too drying, and this objectionable quality should be obviated by the addition of small quantities of glycerin, 2 to 10 minims, to 1 oz.

Astringent Lotions are mainly employed in derangements of the secretory apparatus and in hemorrhagic conditions and contain tannin, alum, iron, acetic acid, formalin, ergot, and drugs having a similar action.

Stimulating Lotions contain cantharides, sulphur, tar, thymol, resorcin, menthol, ichthyol, phenol, and such like remedies. They find their principal use in acne, rosacea, papular eczema, psoriasis, and seborrhea, especially of the scalp in the last-mentioned disorders.

Lotions are usually dabbed on the surface with muslin or cheese-cloth mops. Absorbent cotton should not be used as a mop, as it takes up too much of the lotion and holds it. Where extensive surfaces are involved, as in dermatitis venenata and acute vesicular and erythematous

eruptions, certain lotions like the zinc oxide and calamine preparation may be advantageously applied on strips of cheese-cloth, the whole kept in place with a roller bandage.

R—Liq. plumbi subacetatis ℥x
 Liq. carbonis detergentis 3j
 Aq. destillatæ q. s. ad Oj—M.

S.—A soothing and slightly stimulating lotion. Hutchinson.

R—Saponis viridis ʒiv
 Alcoholis diluti ʒij
 M. cola. et adde
 Spt. lavandulæ ʒj

S.—Shampoo.

Equal parts of Bage's green soap and cologne make a more elegant preparation. Hebra.

R—Acidi carbolici ʒij-ʒiv
 Glycerini ʒij-ʒj
 Aquæ q. s. ad Oj—M.

S.—Antipruritic lotion. Use as a spray.

R—Zinci oxidi ʒss
 Pulv. calamin. præp. ʒiv
 Glycerini ʒij-ʒiv
 Liq. calcis q. s. ad ʒviij—M.

S.—A soothing and slightly astringent lotion.

Distilled or rose water may be substituted for the lime-water. Menthol and carbolie acid may be added, the menthol being first dissolved in alcohol if lime-water is used. Boric acid is also a valuable addition. Startin.

R—Tr. cantharidis ʒvj
 Glycerini ʒij
 Aceti destillati ʒss
 Tr. nucis vomicæ ʒss
 Aquæ rosæ q. s. ad ʒvj—M.

S.—Stimulating lotion for the hair. Tilbury Fox.

R—Resorcini ʒss
 Hydrarg. chlor. corrosiv. gr. ij
 Glycerini ʒj
 Spt. odorati ʒij
 Aq. destillatæ q. s. ad ʒviij—M.

S.—An antiseptic lotion for the scalp. Whitfield.

Ointments.—A large number of diseases of the skin are best treated by means of ointments.

Ointment bases are very various, but the more usual are lard, freshly prepared petrolatum (vaselin), unguentum

aquæ rosæ (cold cream), and lanolin. Spermaceti, wax, oils, suet are used in different proportions as modifying agents. A large number of proprietary preparations have also been brought forward, but for all practical purposes, vaselin, especially the white variety, is the most satisfactory. Lanolin is too stiff used alone, but should be softened with oil of sweet almonds or cold cream. Unguentum aquæ rosæ is a valuable ointment base, and from its power of facilitating evaporation (Unna) is very cooling to the inflamed skin.

Ointments may be conveniently divided into two main classes, viz., **soothing** and **stimulating**, the first class comprising cold creams, zinc and diachylon ointments, preparations of lanolin, water and oil, cocoa butter, and spermaceti, etc., while stimulating ointments contain tar, sulphur, mercury, chrysarobin, ichthyol, salicylic acid, and similar agents.

In nearly all cases soothing salves should be spread on suitable strips of cotton cloth, canton flannel, or patent lint, and neatly bound on the parts. Cheese-cloth and linen should never be used for this purpose, since in a short period the ointment rapidly disappears from the cloth, and leaves the parts covered only by a slightly greasy and crumpled rag. On the other hand, when stimulation or penetration is desired, the ointments should be worked in with the fingers or covered by some impervious substance like rubber tissue.

We are indebted to Professor J. M. Good, of the St. Louis College of Pharmacy, for the appended note on the preparation of ointments:

"The vehicles with which the active medicinal agents are to be combined are various.

"Some are fluid, others soft solids, and others of quite firm consistency, but even the firmest of them have melting points much below the temperature at which water boils. Examples of this class are wax, spermaceti, and the hard, solid paraffin.

"These should be fused (melted) by the heat of a water

bath. Vegetable or animal organic matter is liable to be decomposed by the play of a flame directly upon the vessel containing it.

"Usually, mixtures composed of ingredients of different melting points require to be constantly stirred while cooling, otherwise the least fusible will separate in hard, granular particles and the ointment will be rough and unsatisfactory.

"Exceptions to the rule are melted mixtures of rosin, yellow wax, lard or petrolatum, and paraffin melted together. These should be allowed to cool without being disturbed, otherwise granular mixtures will result.

"More or less water may be incorporated mechanically with an ointment. This may be accomplished by stirring the mixture as it cools and thickens.

"Substances of a saline character should first be dissolved in the minimum amount of water required, by the aid of a gentle heat, and then incorporated with the remainder of the ointment. Insoluble substances, either vegetable drugs, or chemicals, should be reduced to an impalpable powder by trituration before being incorporated with the ointment base.

"If this precaution be not observed, no amount of subsequent rubbing of the mixture will produce a smooth ointment. Some substances, such as powdered opium, extract of opium, red oxide of mercury, etc., may be reduced by trituration with water. Oxide of zinc should be rubbed with a small portion of the ointment until the mixture is entirely free from grittiness, before the main bulk of the fatty base is added.

"Aristol and chrysarobin should be reduced by trituration with liquid petrolatum. The skilful manipulator will bring to his aid, in such work, his knowledge of solvents, such as are bland and neutral, and by this means save himself much labor and secure the best results.

"If muscular energy be needed, however, he must not spare himself. Too often it is thought simple mixing is all that is required. One whose business it is to prepare

ointments should not be allowed thus to deceive himself and others.

"Stock ointments should be stored in a cool place, and those which are liable to become rancid soon should not be prepared in quantity.

"There are but few ointments the preparation of which require more time than the compounding of an ordinary prescription."

R—White wax 200 gm.
Benzoinated lard 800 gm.—M.
S.—Simple ointment. U. S. P.

R—Aque rosæ,
Olei amygdalæ aa 10.0
Cera albæ,
Cetacei aa 1.0—M.
S.—Cold cream. Jamieson.

R—Acidi borici,
Cera albæ,
Paraffin aa 10.0
Olei amygdalæ dulcis 10.0—M.
S.—Soothing ointment. H. Hebra.

R—Olei amygdalæ dulcis,
Aque aa 3j
Lanolini 3vj—M.
S.—Soothing salve. Also an acceptable basis for zinc oxide bismuth, etc. Jamieson.

R—Plumbi oxidi 3iij-3vj
Olei olivarum 3xv
Olei lavandulæ 3ij
Aque q. s.—M.

Bulkley gives the following direction: Add the oil to two pounds of water, and heat with constant stirring; the litharge is to be slowly sifted in while it is well stirred. Stir until cold and then add the lavender.

S.—Soothing and astringent ointment. Hebra.

R—Bismuthi oxidi gr. xv
Acidi oleici 3ij
Cera albæ 3jss
Vasellini 3ivss
Olei rosæ mj—M.

Rub up the bismuth with the oleic acid and let stand for two hours; then place in a water bath, add the vaselin and wax, and stir until cold; finally add the oil of rose.

S.—Soothing ointment. Anderson

R—Emplastrum plumbi,
 Vaselinei aa 3 viij—M.
 Melt together with constant stirring and add
 Oil of geranium q. s.

The lead plaster used should be free of glycerin.

S.—Unguentum vaselini plumbicum. Soothing ointment.
 Piffard.

R—Spermaceti 125 gm.
 White wax 120 gm.
 Expressed oil of almond 560 gm.
 Sodium borate 5 gm.
 Stronger rose-water 1000 gm.—M.

S.—Ointment of rose-water. When the ointment is used as a
 vehicle for metallic salts omit the sodium borate. U. S. P.

R—Zinci carbonatis 3j
 Acidi salicylici gr. x
 Vaselinei 3j
 Ung. aquæ rosæ 3j—M.

S.—Soothing ointment. Jamieson.

R—Boroglycerini 3ij
 Cerae albæ,
 Cetacei aa 3j
 Vaselinei 3vj—M.

S.—Soothing ointment. Duhring.

R—Hydrarg. ammoniati ʒj
 Liq. carbonis detergentis 3j
 Ung. aquæ rosæ 3j—M.

S.—Stimulating ointment.

R—Acidi salicylici ʒj
 Sulphuris præcip. 3j-3ij
 Vaselinei 3j
 Olei limonis q. s.—M.

S.—Stimulating ointment.

R—Olei rusci 3j-3ij
 Ung. aquæ rosæ 3j—M.

S.—Stimulating ointment.

R—Acidi carbolic gr. v
 Pulv. acidi tannici ʒss
 Glyc. acidi tannici ʒss
 Ung. aquæ rosæ 3j—M.

S.—Astringent ointment. Bulkley.

Pastes.—These are local applications consisting of fatty
 matter of various consistencies such as adeps lanæ, lanolin,

vaselin, lard, olive oil and linseed oil, and some inert powder in large quantity, even up to 50 per cent., such as starch, zinc oxide, and certain earths.

Pastes are of value on account of their adhesiveness and porosity, but, as a rule, are unsuited for weeping surfaces.

Pastes generally act more effectively when spread on cloth and bound to the affected parts with a roller bandage, but in many situations, and in small patches of eruption, it is sufficient to smear the preparation on gently and quite thinly with the fingers. The same general rules as to the making of ointments (*vide supra*) hold equally well for the preparation of pastes. There are many formulæ for these pastes (gum, dextrin, kaolin, lead, and glycerin) but the following examples are sufficiently typical:

R—Zinci oxidi,									
Pulv. amyli	aa							3ss	
Vaselini								3j—M.	
This may be medicated with salicylic or boric acid.									Lassar.
R—Acidi borici								℥j	
Pulv. amyli,									
Zinci oxidi	aa							3ij	
Vaselini								3j—M.	
								Duhring.	
R—Terræ siliciæ								3ss	
Sulphuris præcipitati								3ij	
Zinci oxidi								3jss	
Adipis benz.								3j—M.	
								Unna.	
R—Acidi salicylici								gr. x	
Pulv. amyli,									
Bismuthi subnitratiss	aa							3iij	
Ung. aquæ rosæ		q. s.	ad					3j—M.	
								G. H. Fox.	
R—Resorcini								gr. x-xx	
Zinci oxidi,									
Pulv. amyli,									
Vaselini,									
Lanolini	aa							3ij—M.	
								Ihle.	

Salve Pencils.—Salve pencils and paste pencils are but little used in this country. They are designed to furnish a

cleanly and ready method of applying the required drugs in acne, psoriasis, ringworm, etc. The base recommended for the salve pencils by Unna is a mixture of lanolin and wax, or lanolin, wax, and cocoa butter. Audrey advises for the same purpose a combination of cocoa butter, paraffin, and olive oil. Paste pencils contain no fat and are readily soluble. The base consists of starch, tragacanth, gum arabic, sugar, etc.

The alcohol pencils and the resinous pencils may be mentioned in this connection.

R—Sulphuris præcip.	℥ij
Ceræ	℥ij
Adipis lanæ	℥iv—M.
	Unna.

R—Chrysarobini	℥ij
Olei theobrom.	℥v
Paraffin	℥ij
Olei olivæ	℥j—M.
	Audrey.

Glycogelatins.—Pick first suggested the use of gelatin as a vehicle for remedies employed in cutaneous practice. His method of preparation was subsequently greatly improved by Unna, who combined the gelatin and glycerin directly instead of painting the latter over the gelatin after it was put on the skin. The glycerin jellies are very valuable preparations; they relieve congestion, are anti-pruritic, and make a certain elastic compression on the skin. According to Liestikow they even accelerate the evaporation of the cutaneous secretions. Various drugs in certain proportions may be added to the formulæ given below, especially sulphur and ichthyol. These preparations are made ready for use by being placed in a tin, which in turn is set in a vessel of boiling water. The jelly is painted on with a stiff brush, and then covered with tissue paper or a thin layer of absorbent cotton. It is very important that any surface thus treated should be first cleaned with an antiseptic solution suitable to the case in hand.

R—Gelatini,
 Zinci oxidi ʒā ʒj
 Glycerini gr. c
 Aquæ ʒiij—M.

R—Zinci oxidi,
 Gelatini,
 Glycerini,
 Aquæ ʒā pts. æq.

The gelatin is laid in a dish and water poured over it. It is frequently turned until every part has taken up water and become supple. It is then melted in a water bath, and the glycerin previously mixed with the zinc oxide, and any other desired drug, is stirred in.
 Norman Walker.

Plasters.—Plasters are topical applications, variously medicated, having a resinous or fatty base, and are designed for close and continuous use on the skin. The official plasters find little employment in cutaneous practice, with the exception of the emplastrum hydrargyri, while diachylon plaster is used in the preparation of diachylon ointment. Certain unofficial plasters, such as the salicylated soap plasters of Pick and Klotz, mentioned in other parts of this work, are extremely valuable.

A number of years ago Unna suggested the use of plaster mulls, which are made of gutta-percha cloth and spread with the required medicament. As manufactured in Germany, they are very elegant preparations, and can be obtained in almost endless combinations. We have found the salicylic acid and the carbolic-mercury plasters to be the most useful.

The salve mulls are made by incorporating the desired remedy with a base of benzoated suet and lard, which is then spread on one or both sides of muslin:

R—Hydrargyri ʒiv
 Olei terebinthinæ ʒiij
 Cere flav. ʒiij
 Empl. plumbi ʒjss—M.
 S.—Spread on muslin. German formula.

R—Empl. plumbi ʒxxv
 Pulv. saponis ʒiv
 Aquæ q. s.
 Vaselini ʒv
 Camphoræ gr. xx
 Acidi salicylici ʒv—M.
 S.—Spread on muslin

R—Picis burgundicæ	3x
Ceræ flav.,	
Resinæ	aa 3iv
Olei terebinthinæ	3ij
Balsami canadensis	3ss—M.
A vehicle for pyrogallol and resorcin.	
	Duhring.
R—Empl. saponis liq.	3ijss
Olei olivæ	3v
Acidi salicylici	gr. xxxvij—M.
S.—Spread on muslin.	Pick.

Caustics.—These agents are employed in dermatological practice principally for the destruction of new growths, such as lupus and epithelioma, and also for the removal of warts, moles, and hypertrophic conditions generally. Since the introduction of the galvanocautery, the Paquelin cautery, electrolysis, and the *x*-rays, the so-called potential or chemical caustics are not resorted to as much as formerly.

Among the principal caustics may be mentioned caustic potash, chloride of zinc, chromic acid, nitric acid, the acid nitrate of mercury, pyrogallol, lactic acid, trichloroacetic acid, and nitrate of silver. Some of these preparations, like caustic potash, for example, are painful and deeply penetrating, and need the greatest care in their use, while arsenic has a selective action on the diseased tissue; others, like trichloroacetic acid, the acid nitrate of mercury, nitric acid, and the nitrate of silver, if judiciously employed, cause only superficial destruction.

R—Pyrogallol	3ijss—3ijj
Acidi salicylici	gr. xxv-l
Cerat. simplicis	3j—3ij
Petrolati	3j—M.
	q. s. ad
S.—Spread on lint. For epithelioma.	Stelwagon.
R—Acidi arsenosi,	
Acaciæ pulv.	aa 3ij
Orthoform	3ss—M.
Make into a paste with a little water.	
	Norman Walker.
R—Hydrarg. sulphuret rub.	3ss
Ung. aquæ rosæ	3ss—M.
S.—Spread on muslin.	Hebra-Cosme.

R— <i>Farinæ tritici</i> ,			
<i>Amyli</i>	. . . . .	ss	3j
<i>Acidi arsenosi</i>	. . . . .		gr. viij
<i>Hydrarg. sulph. rub.</i>	. . . . .		gr. xl
<i>Ammonii chloridi</i>	. . . . .		gr. xl
<i>Hydrarg. bichloridi</i>	. . . . .		gr. iv
<i>Zinci chloridi cryst.</i>	. . . . .		3j
<i>Aquæ bullientis</i>	. . . . .		3jss—M.

All the ingredients except the zinc and water are finely ground together. The zinc is then dissolved in the water and this is poured upon the powder, stirring all the time. Let it stand for twenty-four hours. Bougard.

Poultices.—Linseed meal and bread poultices, although still much employed by the laity, are now practically given up in medical practice, since they favor the growth of organisms and do more harm than good. Hot borated and carbolyzed compresses are now used for surgical purposes, but for the removal of scales and crusts the boric-acid starch poultice remains a useful application. Norman Walker gives the following direction for making the boric starch poultice: 1 teaspoonful of boric acid is mixed with 4 tablespoonfuls of cold-water starch (wheaten) and enough cold water to bring the mixture to the consistency of cream; 1 pint of boiling water is then gradually added, the mixture being constantly stirred until the starch bursts and a translucent jelly results. When this is cold the amount required is spread on a cloth to the thickness of one-half inch, which in turn is covered with muslin and applied to the part.

Oils and Liniments.—Oils, such as olive oil, almond oil, and linseed oil, are used to remove crusts and scales and also to soothe and protect the inflamed skin. Other oils are added to medicinal preparations for soothing and softening purposes or, in a pure or diluted state, utilized therapeutically, *e. g.*, tar, chaulmoogra and gurgun oil, castor oil, and petroleum oil. Olive oil or linseed oil in combination with lime-water forms the valuable carron oil. The calamine liniment of Crocker is a remedy of great usefulness in extensive eruptions of a certain type, as, for example, pityriasis rubra, bullous eruptions, and moist eczema.

R—Acidi carbolici ℥xx
 Olei amygdalæ dulcis,
 Liq. calcis ʒʒ ʒij—M.

S.—Apply to scalp with medicine dropper in acute eczema.

R—Pulv. calaminæ præp. ʒj
 Zinci oxidi gr. xv
 Liq. calcis,
 Olei amygdalæ dulcis q. s. ad ʒj—M.
 Skinner.

R—Pulv. calaminæ præp. ʒij
 Zinci oxidi ʒss
 Olei olivæ,
 Liq. calcis ʒʒ ʒj—M.

This is greatly improved by the addition of one or two drachms of lanolin. Crocker.

R—Olei petroleii 5 parts
 Olei olivæ 2½ parts
 Balsam peruv. 1 part—M.
 S.—In pediculosis. Kaposi.

Soaps.—Soaps are chemical combinations of the fatty acids with an alkali. They are divided into **hard** (soda) and **soft** (potash) soaps. Hard soaps are used for cleansing and toilet purposes, and really should be neutral in character. Unna was the first to introduce the superfatted soap, which contains the fat in excess. Various medicaments are added to soaps for therapeutic purposes, but, with some exceptions, do not give as satisfactory results as do the same drugs used in some other form. Soft or potash soap, commonly called *sapo viridis*, or green soap, is exceedingly valuable in practice. It is an admirable cleansing agent, besides being stimulating and mildly caustic. It is much employed in psoriasis, seborrhea of the scalp, in thickened eczemas, and lupus erythematosus. It is often introduced into ointments to increase their effect, and is a good vehicle for tar.

Hebra's spiritus saponis kalinus, which consists of 2 parts of green soap and 1 part of alcohol, scented with spirits of lavender, makes an excellent shampoo.

Paints and Varnishes.—These are local applications of a fluid or semisolid nature, which dry on the skin and leave a thin layer of the incorporated drug.

Paints or pigments made with collodion or traumaticine are very useful preparations in the treatment of various diseases. Tar, chrysarobin, pyrogallol, and salicylic acid are the drugs usually employed. Traumaticin is a 10 per cent. solution of gutta-percha in chloroform. In adding an oil to collodion the contractile variety of the latter should be prescribed, since an addition of oil to the flexible kind will make it hyperflexible.

The soluble varnishes made of various substances, gelatin, glycerin, tragacanth, etc., that are readily washed from the skin, are cooling, antipruritic, and protective:

R—Tragacanthæ,	
Glycerini	āā 3iv
Boracis	3ss
Aquæ destillatæ	q. s.—M.
This is the original of all similar preparations. Provan.	

R—Olei cadini	3j
Collodii	3j—M.
A tar paint.	

R—Tragacanthæ	3ijss
Gelatin. opt.	3ij
Glycerini	3vj
Thymolis	gr. ½
Aquæ destillatæ	q. s.—M.

Place the tragacanth and gelatin each in 10 oz. of water in covered jars and make the final quantity up to 12 oz. To this paste may be added resorcin, salicylic acid, and most other drugs except subacetate of lead. Skinner-Unna.

R—Chrysarobini	gr. xlv
Acidi salicylici	gr. xlv
Traumaticini	3j—M.

A traumaticine paint.

R—Tragacanthæ	gr. xxv
Glycerini	mxxx
Aquæ	3xxvss—M.

To this may be added zinc oxide, carbolic acid, etc. Pick.

R—Bassorin	3jss
Dextrin	3vj
Glycerini	3ij
Aquæ	q. s. ad 3xxvss—M.

This may be variously medicated. Elliot.

R.—Acetanilide	3j
Zinc oxide	3iij
Iodized starch, 5 per cent.	3iv—M.

S.—Add sufficient water or liquid vaselin to make a paint. Use as an antiseptic. Lusk.

Baths.—Baths are not so frequently employed in the treatment of skin diseases as in former years, having been largely replaced by other measures. Baths are often positively harmful in acute eczema and pyogenic affections, and in our experience the warm bath, while temporarily allaying the itching in pruritus and urticaria, decidedly increases the discomfort afterward.

Warm baths, medicated or plain, alkaline or emollient, are useful as cleansing and soothing agents in psoriasis, ichthyosis, lichen planus, and similar disorders, and the permanent, general bath as recommended by Hebra is valuable in pemphigus and extensive burns. Tar baths are used in psoriasis and chronic eczema (the patient being first tarred before getting into the bath, or else plunged into a bath containing an emulsion), and the mercurial bath is prescribed in syphilis, especially for children. Sulphur baths may be employed in scabies, and a solution of sodium permanganate added to a bath is curative in pityriasis rosea. Sea bathing is generally harmful in eczema, although salt sponge baths are an excellent adjuvant in the treatment of acne, and according to some authorities in dry, itching eczema. The sulphur and other baths obtainable at the springs, here and abroad, owe much of their influence to the mental effect of change of scene, habits, etc., rather than to any especial virtue of their own.

The following formulæ for baths were suggested by Tilbury Fox. They also have the endorsement of Radcliffe-Crocker. The quantity of water in a bath is estimated at 30 gallons with a temperature of 90° to 95° F.

Soothing and Emollient Baths.—The amounts to be used are either—of bran, 2 to 6 lbs.; of gelatin, $\frac{1}{2}$ to 3 lbs.; of size, 2 to 4 lbs.; of linseed, 1 lb.; or of starch, 1 lb. The starch should be first beaten through a small quantity of water before filling the bath.

Alkaline Bath.—This is made by the addition of 2 to 10 oz. of the carbonate of sodium or carbonate of potassium, or 3 oz. of borax. Bran liquor may be added with advantage. **Used in urticaria, chronic eczema, psoriasis, prickly heat, and lichen.**

Acid Baths.—Add to the bath 1 oz. of nitric or hydrochloric acid, or 1 oz. of each. **Used in chronic pruriginous affections.**

Compound Sulphur Bath.—Precipitated sulphur, 2 oz.; hyposulphite of sodium, 1 oz.; water 1 pt. (Startin). **Used in scabies, body ringworm, psoriasis, etc.**

Mercurial Baths.—Bichloride of mercury, 1 to 3 drachms; hydrochloric acid, 1 drachm; water, 1 pt. For children, take 7 to 30 gr. of the bichloride with an equal quantity of ammonium chloride, first dissolved in some hot water, which add to a bath containing 8 gal. of warm water. **Used in syphilis.**

Tar Bath.—Oil of cade, $12\frac{1}{2}$ drachms; fluidextract of quillaya, $2\frac{1}{2}$ drachms; yolk of egg, 1; water sufficient to make 8 oz. This is added to the bath after first mixing with a little very hot water and vigorously shaken. Instead of this emulsion the patient may be thoroughly tarred and allowed to soak in a warm bath for from three to six hours. **Used in chronic eczema, psoriasis, chronic pemphigus, etc.**

THE OPSONIC METHOD.

The gist of the opsonic method may be stated in the following propositions:

1. Nature provides certain substances capable of combating infections.
2. These substances are produced in answer to the stimulus furnished by the presence of the specific toxin in the blood or tissues.
3. In certain cases of localized infection, toxins do not find their way into the circulation in sufficient quantity to call forth enough of the antagonistic substance or substances to combat successfully the infecting organism.

4. Introducing the specific toxin from without serves to increase the amount of the antagonistic substance or substances in the serum.

5. If the amount of toxin so introduced be too small, it will fall short of its object, whereas if it be too large it only adds fuel to the fire and may change a local into a general infection.

6. It is, therefore, highly desirable to determine the exact dose of toxin required.

7. Among the various antagonistic substances concerned, the opsonins allow of being estimated by the fact that they prepare bacteria for ingestion by the phagocytes. The number of bacteria ingested by a given number of phagocytes, therefore, indicates the proportion of the opsonin present in the serum.

8. The **opsonic index** thus determined shows the dose of toxin required to provoke a response in the way of the production of antagonistic substances sufficient to combat successfully the infection.

9. The toxin may be furnished in the dose thus indicated in the shape of a sterilized and standardized suspension of dead bacteria known as a **vaccine**.

10. Any localized disease caused by a bacterium which can be cultivated outside the body can be treated by this method.

11. This treatment is not so well adapted to systemic infections, for here auto-inoculations occur spontaneously. Our efforts should here rather be directed to converting the systemic into a localized infection, after which the method may be applied.

12. The method may, however, be of use in certain generalized infections, since the artificial inoculation acting primarily on the tissues, instead of on the blood, may call out a larger opsonic response. We shall attempt a brief exposition of the chief facts on which these propositions are based. Two theories have been advanced to account for immunity, the one accrediting immunizing power to certain cells of the blood and the other to the serum.

According to Metchnikoff, certain of the white corpuscles, which he named phagocytes, are the active elements. Ehrlich, on the other hand, holds that the cells of the body have the power of generating and casting into the blood certain substances antagonistic to bacteria or their toxins.

While the fact is clearly established that certain cells—the polymorphonuclear neutrophiles—can and do ingest bacteria, Sir A. E. Wright has shown that they can only do this in the presence of certain substances, which, by uniting with the bacteria and paralyzing them, prepare them for being ingested, as a cook prepares food for the table. These are the opsonins (Greek, *οψωνεω*, I cook for). Corpuscles washed free of plasma will ingest no bacteria until serum containing an opsonin antagonistic to those bacteria is added.

Whether there exists a separate opsonin for each bacterium, or only one common opsonin, has not yet been definitely settled.

Sir A. E. Wright undertook the task of determining the power of resistance to infection possessed by the organism, and, therefore, the amount of toxin required to call forth the degree of resistance desired.

According to Urwick:

1. The opsonic power of different healthy individuals is nearly the same.
2. Their opsonic power does not vary from day to day.
3. The opsonic power of individuals, the subjects of general infections, may be either high (active response) or low (*a*, inherent deficiency; *b*, exhaustion).
4. Their opsonic power varies from day to day, showing positive and negative phases following upon a series of auto-inoculations.

To which one may add:

5. The opsonic power of individuals the subjects of localized infections is often low because the infection is and remains localized—as in lupus, that may last a lifetime without becoming generalized. If and when it

becomes generalized, the opsonic power will become high or fluctuating.

6. A low opsonic power often precedes a localized infection and is its predisposing cause.

7. The opsonic power of the lymph within an area of localized infection (*e. g.*, a boil) is low, while that of the blood may be relatively high—simply because the local supply has been exhausted. This condition is remedied in part by stimulating a more rapid local circulation of the lymph, as by poultices, hot fomentations, phototherapy, etc.

By the “**opsonic index**” is meant the proportion which the opsonic power of the blood of an individual bears to that of the blood of a normal person. The latter is taken as the standard and called *one*. The opsonic index of an infected individual may, as stated above, in Urwick’s third conclusion, be either one, or more than one, or less than one, according as the toxin or the immunizing power is gaining the ascendant.

Soon after inoculation, the index, according to Wright, falls below the normal (negative phase), later it rises above the normal (positive phase).

Since the introduction of bacterial toxins into the blood stimulates the production of protective substances, Wright determined to do the same thing artificially by the injection of standardized and sterilized suspensions of bacteria. These he calls “*vaccines*.” By their use a low index can be raised to normal or higher.

Determination of the Index.—The following must be provided: (1) Washed corpuscles obtained from the blood of a healthy individual; (2) serum from the infected individuals, as well as other specimens from several healthy individuals, to serve as standards and controls; (3) an emulsion of the bacteria concerned in the infection. The manner of obtaining and preparing these reagents need not be entered into here. A number of capillary tubes are filled with mixtures each consisting of one-third bacterial emulsion, one-third corpuscles, and one-third serum taken

from each of the specimens to be investigated. After the mixtures have remained one-quarter hour in the incubator, a small drop from each is spread upon a slide and examined. The number of bacteria contained in any given number of phagocytes, mixed with serum from a healthy person, is counted. This is set down as the denominator of a fraction, the numerator of which is furnished by the number of bacteria counted in an equal number of phagocytes mixed with the serum from the individual under investigation. This fraction expresses the **opsonic index** of the latter. Serum is accepted as a standard when the person furnishing it is healthy by ordinary tests, and when his opsonic index agrees with that of the other apparently healthy individuals taken as controls. (See Urwick's first conclusion.) This is sometimes called Wright's, or the bacillary index. Simon's, or the percentage index, is based on the proportion of leukocytes found which contain bacilli.

The Vaccines.—A description of the complicated processes involved in the preparation, sterilization, and standardization of the vaccines would be out of place in a work intended for the practitioner. The vaccines are "autogenous," that is, they are cultivated for each case from the patient's own bacteria. They consist of the dead bodies of microorganisms sterilized by heating to 60° C. for one hour. The dose varies with the condition of the subject. The dose of tuberculin ranges from $\frac{1}{1200}$ mg. to $\frac{1}{800}$ mg.; that of staphylococcic vaccine contains from 500,000,000 to 2,500,000,000 dead bacteria. One should begin with very small doses and be governed later by the response as shown by the index.

The first step is to determine the opsonic index on several different days. The first dose of vaccine may then be given and the index again determined every few days. The second dose is given a little after the positive phase (see above) has risen a little above the index determined prior to the administration of the vaccine. This will usually be in about ten days, although the time may be shorter or, again, much longer. Later intervals will be of about the

same length, the injections always being made during the positive phase. When the second or succeeding injections are made too soon, or if the dose be too large, the negative phase will be unduly prolonged and accentuated, manifesting itself clinically by fever, malaise, etc., and perhaps permitting the local infection to become general.

Wright believes that the protective inoculation is best made "‘up-stream’ from the focus of infection, *i. e.*, in some part of the lymph watershed which drains through the focus of infection," since "the protective substances which are produced at the site of inoculation may be expected to come into application on the focus of infection in a comparatively undiluted condition."

The method is too technical ever to become generalized among practitioners. Its value is such, however, that it will doubtless come into wide use among those who can command the services of a trained bacteriologist. Sir A. E. Wright, the originator of the method, uses the following language: "I do not hesitate to contend that we have, in the power of raising the antibacterial powers of the blood with respect to any invading microbe, out of all comparison the most valuable asset in medicine."

Attempts to simplify the method have been made in two directions. One is by substituting stock vaccines for the autogenous cultures. The results so obtained are far inferior to those yielded by the original method. The other consists in making but one opsonic determination before the first vaccination, the patient's clinical condition furnishing the indication for later vaccinations. Varney, of Detroit, has obtained satisfactory results by this method.

In dermatological practice the method has been applied to the treatment of localized staphylococcus infections (acne, sycosis, furunculosis), and those of the *Bacillus tuberculosis* (lupus and other cutaneous tuberculosis).

THE MIXED TOXINS OF ERYSIPELAS AND BACILLUS PRODIGIOSUS.

Occasional reports of improvement in malignant growths after accidental infection with erysipelas led to the idea of the therapeutic use of its toxin. The introduction of the living germ, resorted to by Coley in desperate cases prior to 1893, was a dangerous practice, since its later multiplication could not be controlled, whereas the toxin admits of exact dosage. Roger, of Paris, having shown that the *Bacillus prodigiosus* had the power of making the streptococcus of erysipelas more virulent to rabbits, Dr. William B. Coley, of New York, in 1892, combined the two germs, thus securing a mixed toxin for hypodermic use.

The manner of preparing this fluid has been improved, from time to time, since its first introduction. Two strengths are now advised by Dr. Coley. For ordinary cases, the two germs are grown together in bouillon, which is then sterilized by heating, the mixed, unfiltered toxins (that is, containing the dead bacteria) being used. For children and very weak persons, the mixed living cultures are passed through a porcelain filter. The fluid so obtained has only from one-fifteenth to one-tenth the strength of the former.

These toxins, by their presence, bring about a degeneration of certain malignant cells. According to Coley, they are successful in nearly 50 per cent. of spindle-celled sarcomas and in 3 or 4 per cent. of the round-celled form. In carcinoma the method has wrought very few cures, and none in melanotic sarcoma or lymphosarcoma. Its use should be restricted to two classes of cases: (1) Inoperable growths; (2) as a postoperative treatment to destroy possible invisible portions left behind, and thus prevent recurrence.

Injections are best given into the tumor itself, although distant injections also yield results. One should always begin with a minimum dose, $\frac{1}{4}$ to $\frac{1}{2}$ minim into the tumor,

and 1 minim at a distance, gradually increasing until a chill occurs followed by a temperature of 101° to 104° F. Daily injections are better when they can be borne. Otherwise, injections may be given on alternate days. If soft and fluctuating areas appear, they should be opened and drained. Tonics should be given during the treatment, and careful attention be given to keeping the bowels free.

Aseptic precautions are especially important, since the toxin increases susceptibility to pus infection. Reaction, both local and general, is at times quite sharp, consisting of erythema beginning at the puncture and extending for several inches in every direction, chill, fever, headache, and vomiting. At other times but little immediate effect is noted. Our experience substantiates Dr. Coley's statement that successful cases often gain weight steadily during treatment, even in spite of marked reactions. If no improvement be noticeable within four weeks, the treatment should be abandoned. As long, on the contrary, as the growth continues to lessen, injections should be continued. Coley secured disappearance of an inoperable carcinoma after two and one-half years of bi-weekly injections.

GALVANISM.

This agent, apart from its use in electrolysis, to be considered under a separate head, has, in the hands of most dermatologists, been employed in but a few affections, although a list of all those in which it has been essayed and even advocated by individuals possessed of a particular predilection for electrotherapy, would include a large share of our nosology. References to its special employment will be found under the separate heads in the first part of this work. Its chief value, hitherto, has been to control certain subjective symptoms, such as dermatalgia, pruritus, and the pains accompanying or consecutive to zoster; to increase vascular tone, as in rosacea; to promote contraction of the muscular elements of the skin, as in sluggish

types of acne; to stimulate local metabolic and resorptive processes, as in scleroderma, and for cataphoresis. It seems probable, however, that hereafter it, as well as faradism and franklinism, will be largely displaced by the use of high-frequency currents.

The resistance of the human body to the electric current being extraordinarily high, and the contacts at the electrodes usually imperfect, a high electromotive force is demanded, such as is furnished by a number of cells united in series. The high internal resistance of such an arrangement is by no means desirable, as some seem to think, but is unavoidable. The ordinary medical cell furnishes about one volt when fresh. Portable batteries usually contain twenty-four or thirty-two such cells. The old dip batteries, consisting of zinc and carbon elements and a permanganate electrolyte were cumbersome, troublesome, irregular in action, and unreliable. Some of the modern fluid batteries are much better, but far superior in lightness, portability, and general convenience, requiring absolutely no care; and always ready for work are the dry-cell batteries. The cells when exhausted can be replaced at small cost. Almost the only way in which such an apparatus can be damaged is by short-circuiting, as by carelessly laying a moist sponge electrode on the plugging-in board. One should avoid using certain cells repeatedly to the exclusion of others, lest these become exhausted and thus interrupt the circuit, while other cells are still comparatively fresh. It is much better to use the entire number of cells at each sitting, interposing sufficient resistance to reduce the current as desired. The life of the battery will thereby be much lengthened.

The importance of the size and construction of the electrodes is apparent when we remember that the current is equal to the electromotive force divided by the resistance, and that the resistance of an electrode varies inversely as its contact area. Besides, the larger this area, the less the local sensation and reaction. To procure a local effect, therefore, a small electrode should be applied to the area

to be influenced, while the other should be large. For a general effect both electrodes should be large. They should permit of close application to the surface. Lead sheets covered with wash-leather make excellent non-active electrodes.

FARADISM.

We may say of faradism, as of galvanism and franklinism, that since the advent of the high-frequency current its use in cutaneous therapy promises to be even more restricted than it has hitherto been. Of the three modalities first mentioned, faradism has probably been the least employed. Stelwagon, however, believes it to be of value in acne, using an ordinary or roller electrode; in alopecia, with a special metallic comb or brush, and in alopecia areata, applied with a tinsel electrode. References to its employment in certain other conditions will be found in the first part of this work. Faradic currents, as well as galvanic and sinusoidal, have been used in electric baths.

STATIO ELECTRICITY.

This agent has never been accorded a wide application in dermatological practice, and it now seems probable that it is to be largely ousted even from its restricted field by the high-frequency current. Inasmuch as most practitioners engaged in x-ray work use the coil, they will naturally add to it a high-frequency apparatus, which can be done at small cost. The smaller number who employ a static machine will probably continue its occasional therapeutic use, as the two forms of electricity yield similar results in many respects.

Static electricity may be employed either generally or locally.

Brocq, Shoemaker, and Stelwagon are the chief advocates of its general tonic and alterative action in cutaneous

disease associated with lack of nervous tone, such as urticaria, pruritus, prurigo, and certain forms of eczema.

Locally, the roller electrode is applied (over the clothing) in conditions of disturbed local innervation, and the spark in alopecia areata.

The chief methods of application are as follows:

1. **The Static "Bath."**—The patient is placed upon an insulated stool connected with one pole of the machine while the other pole is grounded. If the stool be connected with the positive pole the patient is charged with positive electricity, which gradually leaks off into the surrounding air. If it be connected with the negative pole, the current is naturally inverse. The "bath" may thus be either positive or negative. It is usually continued for from ten minutes to one-half hour.

2. **The Static Breeze.**—The patient being placed on the stool, the operator brings an electrode terminating in one or several metallic points a few inches from the surface to be treated. The stream of repelled electrons is felt as a breeze.

3. **The Effluve.**—This is produced with a blunt, wooden electrode and causes a mild, stinging sensation.

4. **The Douche.**—The patient, being seated on the stool, receives a discharge from an electrode in the form of a crown or disk, furnished with numerous points, which is suspended over his head.

5. **The Roller.**—This is moved along over the patient's clothes, and occasions a sharp, pricking sensation.

6. **The Spark.**—This is obtained with a metallic electrode terminating in a ball, and causes a sharp, evanescent, local reaction, characterized by spasmodic contraction of the muscular elements of the skin.

Friction machines have long been abandoned. Of the influence machines, the Wimshurst and its modifications are virtually unknown in this country, where the Holtz and Toepler-Holtz are used to the exclusion of other types. The latter has the advantage of being self-charging, while the former yields a steadier and less painful discharge, and a longer spark.

HIGH-FREQUENCY CURRENTS.

A "high-frequency" current is one characterized by its extremely rapid oscillations in opposite directions, perhaps as many as 100,000,000 per second, and at a high voltage. It possesses the remarkable property of communicating similar oscillations to any body possessing electrical capacity which may be brought into contact with it, even though in "open circuit," in other words, even though contact be established at only one point. Let us briefly review the principles concerned in its production.

When contact is made between the outer and inner armatures of a charged Leyden jar, they are discharged. It was supposed that this discharge consisted of a simple and immediate passage of opposite electricities in opposite directions, until 1842, when Joseph Henry showed that this was true only when the conductor was of high resistance. With a conductor of low resistance, discharge is completed only after a series of exceedingly rapid oscillations or surges to and fro, each surge as it were overreaching itself, so that the higher potential exists alternately on the inside and outside of the jar, but in gradually lessening amount, until both armatures are brought to the same electric level.

This fact is utilized in the production of high-frequency currents. The discharge, however, occurs between the inner armatures of two jars or other condensers. In order to maintain the charges at their original potential, the internal armatures of the condensers are connected to the secondary terminals of an induction coil, or to the poles of a static machine. An air gap, introduced between the inner armatures as a resistance, permits the accumulation of electromotive force in the condenser. As soon as the electromotive force has accumulated sufficiently to break down the resistance, a spark crosses. The resistance of the gap at once sinks down to nearly *nil*, and the to-and-fro surges begin, just as a pendulum will swing to and fro

as soon as released. This happens in the latter case because the medium, air, is easily displaced, or, in other words, of low resistance. If the medium were of high resistance, such as a thick oil, oscillation would be checked, as in a meter that is "dead beat." So with a condenser, oscillation can only occur with a conductor of low resistance, such as comes into existence with the passage of the spark.

The current so created, while possessing a sufficiently rapid period of oscillation, is too weak for practical use. In order to increase its tension and the consequent electrostatic effects in its vicinity, we make use of two coils of wire, or one coil divided into two parts, the first known as the solenoid, vibrator, or exciter, and the second as the resonator.

In order to understand the functions of these devices, it will be necessary to consider some of the properties of high-frequency currents. Their propagation in "open circuit" was mentioned in the opening paragraph of this article. Another important phenomenon is that of **resonance**. The term is borrowed from the physics of sound production. Vibrations produced in one body may be communicated to another, such as a sounding board, and the sound thus amplified. These may be **forced vibrations**, of the same period as those of the tuning fork, violin-string, or other exciting body. Besides these, however, the sounding board possesses a period of vibration of its own and responds more readily to that tone than to any other. Electrical "resonance" presents a close parallel to this. In any two-way current the curve of quantity regularly rises and falls above and below the zero line. Besides this there is the curve of potential or tension. These two do not necessarily coincide. Self-induction in the circuit tends to make the wave of electromotive force lag behind that of amperage, while increase in capacity brings it ahead of the latter. Careful adjustment of self-induction and capacity brings the crests of the two waves together. When this occurs there is said to be **resonance**. This manifests itself at certain nodal points along the circuit, so that it is neces-

sary to tap the circuit at the proper point, in order to obtain the effect. The position of such a node in a resonator can be determined by experimentation. At a point midway between two nodes the effect would be *nil*, with increase in either direction.

The period of oscillation of a circuit depends upon its capacity, self-induction, and resistance.

If the resonator be "tuned" to the solenoid, the resulting interaction between syntonistic circuits will greatly increase the energy of the current.

The quantity of current will depend upon the energy in the primary coil, the spark length between the internal armatures, and the self-induction of the solenoid and resonator.

In the d'Arsonval resonator a few turns of heavy wire surround an ebonite cylinder at a distance of a few inches. Upon the cylinder are wound many turns of fine wire. A current at a greatly increased tension is thus induced in the latter. Oudin's inductoresonator consists of thirty or forty turns of wire. Several turns at the bottom are led into a circuit between the armatures, and thus serve as the solenoid. The other turns form the resonator.

The connection between the resonator and patient may be direct or indirect, and is made in various ways. The use of the high-frequency current in dermatology, however, is virtually limited to the effleuve from an electrode connected with a single or "open-circuit" wire led off from the end or top of the resonator. One of the most astonishing physiological properties of these currents is that they produce no sensation nor muscular contraction. Under proper conditions, a current can be passed through the body capable of lighting 125 lamps of 1 ampère each, each mounted in series, without causing discomfort. In order to accomplish this negative result, the oscillations must be extremely rapid. It is well known that muscular contractions due to electric (or other) stimuli become fused, when the latter are rapidly repeated, into a continuous or "tetanic" contraction. As the rapidity of stimulation is

increased, the tetanic response at first rises; then, as the stimuli increase from 2500 to 5000 per second, remains at the same level, and with a further increase begins again to decline. As the rate of oscillation rises still higher, all contraction is finally abolished. The most plausible of the theories invoked to account for this absence of reaction is that duration of flux in one direction is not sufficient to overcome tissue resistance and awake a response. The current energy is consumed in exciting the molecular disturbances which characterize the latent stage of a contraction. This theory, thus, at the same time, explains the increased metabolism attendant upon the presence of currents of high frequency. These currents also exert nervous and muscular inhibitory effects which may account for the observed anesthesia, muscular relaxation (diminished excitability), and vasodilatation with consequent fall of blood pressure. Effluviation causes tactile, thermal, and superficial pain-sense anesthesia, soon replaced by hyperesthesia. There is vasoconstriction, soon followed by vasodilatation, when the electrode is held at a little distance from the skin. Vasocnstriction does not occur when the electrode is in contact with the surface.

High-frequency currents have been found of service chiefly in pruritic affections, such as pruritus, especially the local forms, prurigo, urticaria, etc., and in such circulatory disturbances as lupus erythematosus, rosacea, and some eczemas. Allen mentions acne, molluscum contagiosum, sycosis, impetigo, lupus, common and venereal warts, keloid, atrophy of skin, alopecia areata, pityriasis versicolor, and pigmentations. He employs "sparking" from a pointed metallic electrode for destruction of small tumors, vascular and other nevi, epithelioma, lupus, etc., protecting the surface with a sheet of vulcanite presenting an aperture just large enough to expose the lesion. We have obtained excellent results with this agent in general defluvium capillorum in women, uncomplicated with seborrhea.

Special indications for the use of these currents will be found under the different diseases.

ELECTROLYSIS.

The principle of electrolysis is illustrated by the familiar experiment of plunging two platinum wires into acidulated water a little distance apart, one wire being connected with the positive pole of a galvanic battery, and the other with the negative. As soon as the current passes, decomposition of the water into its component gases begins, the electropositive element, hydrogen, being liberated at the negative electrode, while the electronegative element, oxygen, appears at the positive wire. The gases may be collected for testing over their respective electrodes. It is at first sight a little puzzling that only one gas should appear at each pole, since each molecule of water contains both. This phenomenon is accounted for by an exchange of elements along a chain of molecules from one electrode to the other. We may, if we choose, mentally picture the hydrogen in each molecule as combining with the oxygen in the one next adjacent in the direction of the negative electrode, thus forming a new set of molecules and leaving over an atom of hydrogen to be liberated at the end of the chain, while the same thing is occurring with respect to oxygen in the opposite direction.

Therapeutically, we produce the same effect on the watery element of the blood and tissues. In bipolar electrolysis two needles are plunged into the tissue to be acted upon—one connected with each pole of the battery. The method is not wholly satisfactory, inasmuch as there is a wide difference between the reaction obtained at the two needles. The oxygen at the positive electrode determines a coagulation of albumins, giving a relatively dry eschar and causing the tissues to adhere to the needle, while at the negative electrode, in default of coagulation, the little mass of destroyed tissue is less contracted and moister, allowing easy withdrawal of the needle.

Unipolar electrolysis, employing the negative needle, is the method of choice in dermatological practice. The

technique is set forth in full in the article on Hypertrichosis. For the destruction of varicose vessels, in the second stage of rosacea, a fine needle is passed into the venule. When the current is made, close observation will detect minute bubbles of hydrogen coursing along the dilated vessel, soon after which the little vascular twig momentarily appears outlined by its pallor. For the destruction of warts, small epitheliomata, and other small lesions, a number of parallel through-and-through punctures are made across the base of the growth, intersected by a second series at right angles to the first, thus forming, as it were, a floor of necrosis which shuts off the nutrition of the tissues above its level. In dealing with flat pigmentary nevi the finest needle obtainable should be passed in horizontally at the level of the papillary body, as many punctures being made as necessary. The indications for the use of electrolysis, in the various affections, can be found in the first part of this work.

CATAPHORESIS.

Cataphoresis is the power of the galvanic current to induce osmosis from the positive to the negative pole (Billings). It is, therefore, also called electrical osmosis.

In medical parlance the term means: (1) The introducing of drugs through the unbroken skin by means of galvanism. Its feasibility is proved by the finding of the substance in the urine or saliva. Experiments in this direction were made as long ago as 1747, and taken up with renewed ardor about one hundred years later. (2) Introduction through an ulcerated surface. (3) The simultaneous employment of cataphoresis, properly so called, with electrolysis. A metallic disk is applied to an ulcerated surface, or a needle thrust into the tissues. A soluble salt of the metal being formed by electrolysis, acts in part as a cauterant on surfaces in immediate contact, and is in part carried from the positive pole into more distant tissues by cataphoresis, there exerting an antiseptic or other remedial effect.

While, as already implied, drugs may by this means be introduced into the circulation, the method is virtually restricted to driving them into the tissues adjacent to the positive electrode. Its chief applications to cutaneous therapy are here mentioned:

1. Cataphoresis through the unbroken skin.

This method was advocated some twenty years ago in vegetable parasitic diseases of the hair, as a means of overcoming the difficulties of medication incident to the inaccessible situation of the fungus. Whatever importance it may have acquired has been much lessened by the advent of the x-rays as an epilating agent.

The introduction of cocaine and other local analgesics by cataphoresis through the skin has been less successful than that by way of the mucous membranes. In the former case the surface should be well cleansed of fat by soap and water followed by ether.

A flat, metal electrode is covered with several layers of plain gauze soaked in a solution of the drug to be used. In the case of cocaine this must not be less than 10 per cent. This electrode, connected with the positive pole of a battery, is placed over the surface to be treated, and the negative electrode at any indifferent point. Eight to 30 volts may be used. The resistance of the horny layer being enormous, the current is at first but a few milliamperes. Soon, however, it begins to rise, owing to the epidermis under the positive electrode becoming a better conductor as the solution permeates it. The current may be continued for ten to fifteen minutes.

2. Cataphoresis through an ulcerated surface has been recently advocated in superficial epithelioma, q. v.

3. Cataphoresis used concurrently with electrolysis. Gautier treated actinomycosis, lupus, and sycosis by introducing a copper needle connected to the positive pole, thus obtaining an oxychloride of copper. In the condition first named he also used the plan of first injecting a solution of potassium iodide. Edwards uses zinc or zinc-mercury disks in superficial epithelioma, q. v.

Morton, of New York, and Massey, of Philadelphia employed cataphoresis in inoperable cancer. J. McFadden Gaston successfully treated a small, round-celled sarcoma in this way.

THE X-RAYS.

Introduction.—It was in 1895 that Röntgen, studying the phenomena incident to the passage of an electric discharge through a Crookes tube, found a form of radiant energy which, although invisible, could affect the photographic plate, and possessed the remarkable property of passing through many bodies opaque to light.

Röntgen became aware of the existence of these rays by the fact that some crystals of barium platinocyanide which were lying near by became luminous. This led him to construct a screen covered with a layer of this substance, to which was given the name of **fluoroscope**.

A full exposition of the nature of these phenomena would be foreign to the scope of this work. It may be well, however, to give a succinct account of the physical facts on which they rest.

It is well known that when two terminals, the one connected with the positive end of a source of electric energy and the other with the negative, are brought sufficiently near to each other, there occur certain modifications of the intervening air space. According to present ideas, the atoms are broken up into their constituent **ions** or **electrons**, that is, into units, some charged with (or consisting of) positive electricity and some negative.

If the **voltage** be sufficient, that is, if the electric pressure be sufficiently high to overcome the resistance, there will be incandescence of the air along the path of discharge, with sudden rarefaction, the collision between air surfaces rushing back to occupy the spaces from which they have just been displaced occasioning a sharp report. In other words, there is **sparking**.

Let the terminals be enclosed within a glass shell con-

nected with an exhaust apparatus. As the atmosphere is progressively rarefied we may observe the phenomena attending the passage of the current.

At first the line of sparks widens out into luminous plumes, continuous from one terminal to the other. The number of molecules of gas within the shell being still further reduced, and the resistance correspondingly increased, the luminous plumes change to an uninterrupted glow surrounding each terminal, with a dark space between.

Let us now employ Crookes' original tube, the negative terminal or **cathode** being at one end of the tube and the positive or **anode** introduced at one side. With a further degree of rarefaction a dark space appears, bounded on one side by the cathode and on the other by a luminous zone. Air pressure being further reduced, the width of the dark zone increases until it extends to the opposite wall of the tube, which now becomes luminous. With the highest vacuum obtainable, resistance becomes so great that there is no further passage of electricity, and a consequent cessation of visible manifestations.

Crookes' explanation of these phenomena is substantially as follows: The terminals being electrified, the atoms of gas are dissociated into their component electrons. The negative electrons, each believed to possess a mass equal to about $\frac{1}{1800}$ of an atom of hydrogen, which are in contact with, or near, the cathode, are violently driven off, in accordance with the well-known law, that, whereas bodies possessing opposite electrifications are attracted to each other, those similarly charged are repelled. In a low vacuum, the electrons, before they have travelled any distance, come into violent collision with other electrons, as in the case of a person attempting to cross a ball-room crowded with dancers. These collisions, by the heat so generated, occasion the luminous glow about the terminals. Now as the vacuum becomes higher, the electrons are allowed to make a longer rush before being "tackled," and thus occurs the dark space about the cathode which widens as the

electrons in their path become fewer and, therefore, the chances of collisions grow less. Finally, the total number of electrons within the tube is so reduced that they pursue parallel paths without interruption, until stopped by the opposite glass wall, which begins to fluoresce under their bombardment. This flight of negative electrons across the tube (at a rate estimated by Crookes at 15,000 miles a second, or about $\frac{1}{12}$ that of light; J. J. Thomson and Lenard call it about $\frac{1}{10}$) is known as the Cathode Ray. If this theory be correct, it is an instance of electric convection. Wiedemann, on the other hand, holds to the hypothesis that the cathode ray consists of very short ether waves.

Whatever theory we adopt, the facts are that this ray travels in a direction perpendicular to the plane of the cathode (irrespective of the position of the anode), that it carries a negative charge, that it can be deflected by a magnet, and that it causes fluorescence of the opposite wall of the tube. At the points of impact of the cathode rays with the glass, there originate Röntgen rays, or, as Röntgen named them, x -rays, expressing thereby the fact that their nature was unknown. These penetrate many media impermeable to light, the opacity of media to the rays varying in a general way as their density; they travel in straight lines in all directions from their points of origin; cannot be reflected, refracted, diffracted nor polarized, and show no interference phenomena, that is, they exhibit along their course no points of increased or diminished intensity such as arise from the superposition of waves of different phase. These negative characteristics are perhaps due to their extremely short wave length (according to Haya and Wind only $\frac{1}{2000}$ the length of a wave of green light). They affect the photographic plate and excite fluorescence in certain chemical substances. They are not affected by a magnetic or electric field, but rapidly discharge all near-by electrified bodies. This they do by ionizing the air, that is, by making it a conductor. The air retains its conductivity for awhile even after it is blown out of the path of the rays.

While, as just stated, x -rays are not reflected, yet they possess a property which yields results in some particulars like those of reflection, namely, that solid matter on which they impinge emits secondary x -rays, which may in turn excite tertiary rays. These are less penetrating than the original rays. A practical deduction from this fact is the presence of rays virtually in all directions about an active tube.

The velocity of the rays, according to Blondlot, is the same as that of Hertz waves or of light. This all but proves that the x -rays are disturbances of the ether and not a flight of material particles such as is the cathode rays.

The year following Röntgen's discovery, Jackson improved the tube by inserting a platinum disk at an oblique angle to the path of the cathode rays. This being connected to the anode by a wire outside the tube, is itself really an anode, but is known as the **anticathode** or **target**. In this form of tube the x -rays originate at the anticathode and spread over that half of the tube which it faces. In some tubes there are but two terminal points, the anode terminating in a disk set at an oblique angle to the path of the cathode rays, and thus itself serving as an anticathode. The cathode terminal is concave, the centre of its curvature, in a good tube, coinciding with the centre of the anode. The plane of the latter should be at an angle of 45 degrees to the axis of the tube.

With radioscopy and radiography we are here not concerned. The use of the rays for these purposes, however, occasionally caused painful and sometimes serious inflammation and destruction of tissues within exposed areas of patients and of the operator's hands. This, in 1896, suggested to Schiff and Freund the idea of employing this reaction as a therapeutic agent.

Installation.—In order to obtain x -rays we require a Crookes tube and a source of electrical energy at high pressure, but of comparatively small volume.

For the latter purpose we may use the static machine or an induction coil.

The Static Machine.—There are two types of this device, the friction machine and the influence machine. The latter only is used in the production of x -rays. In order to secure high voltage a number of disks or plates are used. These should be made of material possessing a high dielectric coefficient; glass, mica, or ebonite being used. The power to revolve the plates may be furnished by an electric or other motor, or by hand.

Good machines furnished with 16 stationary and 16 revolving plates will furnish a small volume of electricity, perhaps as low as 5 ma., at from 100,000 to 500,000 volts, giving with a proper tube a clear and steady light with distinctly outlined hemisphere. The discharge is much weaker than that from a coil, but on the other hand occupies the whole period with an even flow. The advantages claimed for the static machine are, first, that it furnishes a one-way current, that is, there is no reverse surge due to changes of polarity, as with the coil, and thus the life of the tube is increased; and, in the second place, that there is no necessity for an interrupter, confessedly the most troublesome part of a coil outfit. Besides, it permits the use of much lighter and, therefore, cheaper tubes. The objections urged against the static machine by European writers, that they easily get out of order, that they require constant care such as daily wiping of the plates and frequent washing in alcohol, etc., do not apply to the greatly superior American machines, which only require keeping a little common lime in the case as a drier, to be changed, perhaps, once in two weeks in the summer, and once in the course of the winter, varying a little from this according to humidity. Experienced operators maintain one or, better, several spark-gaps on the negative side.

A peculiarity of the static machine is that its output increases with the resistance. Therefore, with it a hard tube will give not only more penetrating rays, but a greater number of rays, both hard and soft. This is why certain observers, working with a static machine, have reported a more rapid effect from a hard than from a soft tube.

An influence machine, such as the Holtz, or Toepler-Holtz, of sufficient voltage, will give very satisfactory results in the hands of one accustomed to its use. In the country or in small towns not furnished with a public supply, such a machine is the only available source of energy.

The contention that burns caused by a static machine are less severe than those from a coil is not in accord with observed facts.

The Induction Coil.—A description of the construction of the coil or an exposition of the laws involved in its operation would be here out of place. The proportion between the calibres of the primary and secondary wires and the number of windings of each can only be determined when the voltage and ampèrage of the supply energizing the coil and the desired output of the secondary, or in other words the kind of work to be done, are known. A reliable maker, on being given the particulars as to the available supply of power, will, if the latter be sufficient, furnish a coil wound so as to yield the necessary current for therapeutics, or for light or heavy radiographic work. There are a number of excellent coils, expressly designed for the production of the *x*-rays, now upon the American market.

Inasmuch as all cutaneous therapy is best done with an equivalent spark of less than six inches, and most of it with less than half that, it might seem a useless extravagance to buy a coil capable of furnishing a spark of twelve inches or more. So, indeed it is, if one believes, with Pusey, in limiting one's self to the use of currents of low intensity. For obtaining a larger volume, however, one needs a coil capable of yielding a spark twice as long as will ever be used, as only then will the shorter spark-lengths be accompanied by any considerable amount of energy.

The Condenser.—The better coils are furnished with condensers of which the capacity may be varied at will. Practically, however, the operator soon learns what condenser capacity gives the best result and finds no occasion to change it thereafter. The condenser takes up the extra

direct current produced in the primary by the break. This extra current, rebounding, is led back through the primary in the opposite direction, thus opposing the direct current and rapidly demagnetizing the core. As the electromotive force in the secondary depends upon the rapidity with which the lines of force disappear, it is much increased by the use of the condenser. Besides, were not the extra direct current thus taken care of, it would produce heavy and injurious sparking at the break in the interrupter. This is easily demonstrated in any coil operated through a mechanical interrupter by switching out the condenser. With electrolytic interrupters no condenser is used, as the extra current is itself the electrolytic agent (see p. 549).

Inductance.—Large coils are generally made with a primary of **variable inductance** (formerly spoken of as the coefficient of self-induction), that is, that factor which multiplied by the current strength determines the amount of self-induction. The primary is wound in two or more sections which may be connected up either in series or in parallel. With the former arrangement, self-induction is greater, the break less sharp, and the output between the secondary terminals, as shown by the spark-length, considerably less. This is best suited to soft tubes. With hard tubes the sections connected in parallel give better results. We are thus furnished with another method of controlling the amount of energy supplied by the coil, an intelligent use of which will add materially to the life of the tube. In American machines this arrangement is controlled by a switch instead of the cumbersome devices of the German coils.

Spark-gaps.—Coils are furnished with adjustable series and parallel spark-gaps. The former, which may be one or several at each pole, serve to insert resistances into the secondary circuit, and thus help to eliminate that secondary current which accompanies the make or closure of the primary circuit. This current is at a far lower voltage than the break current, although the ampèrage is the same. The secondary current is by this device made unidirectional,

eliminating the reverse surge through the tube, and thus preserving it from injury. The resistance within the tube itself, however, generally accomplishes this, at least in great part. The valve tube to be inserted into the secondary circuit is designed for the same end. While doubtless efficient, it may usually be dispensed with, the series gaps answering the purpose desired. Of course, without some such arrangement an induction coil could not be said to have an anode and a cathode, inasmuch as these are constantly being reversed. With it, however, we can neglect the polarity originated by the make.

The **parallel gap** is so disposed as to offer a "shunt" circuit or alternative path for the secondary current. Electricity, like everything else, following the line of least resistance, will either pass through the conducting wires and tube, or leap the parallel gap, accordingly as one or the other offers the easier path. The length of the gap, therefore becomes a measure of resistance within the tube, and when used for that purpose is called a **spintermeter**. When we speak of a "6-in." or a "15-cm." tube, we, therefore, mean one possessing a vacuum of such resistance as can only be overcome by a current capable of sparking in the air across a gap of that length.

A **voltmeter** and **ammeter** in the primary circuit are useful as indicating in a general way the amount of energy being expended. We must remember, however, that the current actually passing through the tube is probably at several thousand times the voltage, and only at the several thousandth part of the ampèrage of that of the primary. Many successful American operators dispense with meters altogether and derive sufficient guidance from the degree of illumination of the tube.

Sources of Energy.—The coil may be energized from various sources. The current entering the primary must be unidirectional and intermittent. In cities where a direct current is supplied, this may be led immediately into the machine by introducing sufficient resistance to lower it to the potential suited to the particular installation. Where

only an alternating current can be had, this may be used to operate a motor to which is then geared a dynamo furnishing a direct current of the desired voltage and ampèreage.

There exist other methods for converting an alternating into a one-way current. One of these is the electric valve, in which one electrode is made of aluminum and the other of some other metal. A thin coating of oxide interferes with the passage of the current when the aluminum is the anode, but allows it to pass freely in the opposite direction. This conversion is also effected by several types of interrupters, as described below. A storage battery may be used when a supply current for storing is available. The latter arrangement is, perhaps, the most practicable one for operating the smaller portable coils, giving, say, up to an eight-inch spark, although a public direct-current supply may be utilized by introducing sufficient resistance. Galvanic batteries are ill-suited to the purpose.

The Rheostat.—A rheostat is introduced into the primary circuit, by which the strength of the inducing current may be varied, thus permitting us to affect the induced current through the tube.

The Interrupter.—Perhaps no part of the installation will require as much thought or elicit such a variety of opinion as the choice of an interrupter. Here again, the operator wishing to employ his equipment in diagnosis will obtain the best results with an electrolytic interrupter capable of accommodating a large voltage, or with a mechanical device of the revolving type such as the Contremoulin, giving the sharpest break, and supplied with a device for altering the positions of the collecting brushes, allowing the operator to modify the cycle so as to increase the time occupied in the passage of the current at the expense of the pause, thus increasing the maximum current in the primary. One may thus dispense with a rheostat. For treatment, instruments affording sixty breaks per second or even less will be sufficient.

Smaller coils are often provided with a modification of the Neef hammer, such as the *independent vibrator*. Here the

vibrator, which is attracted by the magnetized core, does not itself break the contact, but at a point in its excursion, when it has acquired a high rate of speed, strikes upon another spring through which the current passes, and pushes it away from its contact, thus affording a sharper break. While this is a great improvement on the original vibrator, there is still some cling at the break, and the light in the tube is not perfectly steady. In order to avoid variations in the operation of the interrupter due to changes in the primary current, and, therefore, in the magnetization of the core, there is sometimes provided a small, separate magnet operated by an independent circuit. In the **mercury dip** a silver needle is alternately plunged into and raised from a cup containing mercury covered with a layer of petroleum. The time occupied by the passage of the current may be increased by lengthening the needle. An American firm makes a dip interrupter in which the make can be so synchronized as to take only the crests of alternating waves, and thus convert an alternating into a direct current. In the **Mackenzie Davidson break** a segmented copper disk rotates at an oblique angle to the surface of the mercury.

The Mercury Jet or Turbine.—Cunningham's modification consists of a closed vessel, the bottom of which forms a well containing mercury. Into this dips a perpendicular tube containing a rotary pump, open below the surface of the mercury, with a pivot fitting into a bearing below. Above, the tube is continuous with a spindle projecting through the cover of the vessel.

About half-way toward the top of the vessel, the tube divides into two, passing out at right angles in opposite directions, each terminating in a fine opening. In close proximity to the inner wall of the vessel are two metallic sectors, each occupying about one-quarter of the circumference, and connected each with a binding post projecting above the cover. By means of these the apparatus is introduced into the circuit before it enters the coil. Belting connected with a small motor, or, in case a motor generator

is used to energize the coil, connected directly to the latter, serves to rapidly revolve the spindle, and with it the system of tubes. The mercury is drawn up from the well and projected in a fine spray against the wall of the vessel, to fall back into the well at the bottom. During a part of each revolution the spray impinges against the metallic sectors above mentioned, at which time the circuit is closed from one sector, through the mercury spray, to the other. If the extra direct current be not fully taken up by the condenser there will be much sparking within the apparatus, and an oxide mixed with pulverized mercury, in the form of a grayish powder, is rapidly formed, clogging the tubes, and requiring frequent cleansing. With the condenser set at its proper capacity, however, this interrupter can be used many times daily for a year or more without demanding attention. A special form of this device also serves to convert an alternating into a direct current. In the German instruments the spray is fixed while the sectors revolve, and the break takes place in oil.

An ingenious modification of the mercury-jet interrupter is known as the *autonome*. In this arrangement the interrupter is connected with the motor both mechanically and electrically, so that the same interruption serves both for the coil and the interrupter. The rotations must be started by the hand.

The electrolytic interrupter is well adapted to short runs, as for radiography, but does not answer for longer exposures such as are used in treatment, as well as the mechanical devices. It can only be used with heavy voltages. It yields an especially large output at the secondary terminal within a given time. The electrolytic interrupter, of which Wehnelt's is the type, consists essentially of a lead electrode, exposing a large surface, and connected with the negative pole, and one or several platinum electrodes, exposing a small surface, and connected with the positive pole. Both are plunged into an electrolyte, such as dilute sulphuric acid. The platinum electrode is enclosed in a porcelain cylinder provided with a small opening at its lower end. In

consequence of the high resistance to the passage of the current offered by the small surface of fluid in contact with the anode, the fluid at such contact is rapidly heated and forms a layer of vapor about the anode. The extra resistance, so introduced, considerably reduces the current.

This reduction brings into existence by self-induction in the primary an extra current, which produces electrolytic decomposition of the layer of vapor into its component oxygen and hydrogen. These gases suddenly combining by their explosion form an absolutely non-conducting space about the anode, and complete the interruption. The fluid once more coming into contact with the anode, the same process is repeated several hundred times a second. The strength of current yielded by the machine will depend upon the voltage of the inducing current, the self-induction in the primary, and the extent of anode surface exposed to the electrolyte. If the platinum of the anode be pushed farther out from its insulating porcelain cylinder, the current will be increased, but the interruptions will be less rapid. If the rheostat be pushed back toward zero, both the current and the frequency of interruption will be increased. With this type of interrupter no condenser is required.

The objections to this interrupter are the frequent breaking of porcelain cylinders, caused by explosions of the mixed gases; that it will not operate with low voltages; and that when long in action the liquid becomes heated and the interruptions become irregular or cease. The latter difficulty may be in part obviated by passing a current of cold water through a coil in the jar, or by using large jars. During use a bubble of gas may collect over the anode, preventing contact and thus stopping the apparatus. Shaking the anode, or momentarily reversing the current, will dislodge the bubble.

The electrolytic interrupter can be used to convert an alternating into a unidirectional current, although results so obtained are not as good as when the original current is unidirectional.

The Caldwell-Simon liquid interrupter does not operate by electrolysis. It is thus described by Mr. Caldwell: "It consists of a jar containing dilute sulphuric acid, within which is a cup of insulating material perforated by a small hole. Lead electrodes are placed in the outer jar and in the insulating cup.

"When the primary current of an induction coil is passed through this apparatus, there is comparatively little heating of the liquid, except in the aperture connecting the two chambers, where the current density is very large on account of the small area of the aperture. At this point, therefore, sufficient heat is developed to vaporize rapidly the liquid, and bubbles of steam which form break the connection between the liquid in the inner jar and that in the outer jar. As soon as the current is broken the heating stops, and the two portions of the liquid come together again, completing the circuit."

Increasing the frequency of interruption increases the sharpness of the break and, therefore, the voltage in the secondary circuit. Increasing the time allowed for flow at the expense of break, within certain limits, increases secondary voltage. Whether this means higher electromotive force, or more current, will depend upon several considerations which cannot here be discussed.

The Milliammeter.—In order to show the actual amount of current passing through the tube, one may use a **milliammeter** interposed in the tube circuit. It also detects the presence of an inverse current and indicates a rise or fall in the vacuum in the tube. While of value as an additional datum for the comparison of technique, it cannot be considered an essential part of the outfit. At best it does not tell us the wattage, which would be the only real measure of the efficiency of the secondary circuit.

The Tube.—The physics concerned in the production of the rays have already been set forth in part (see p. 538). It remains for us to consider the factors which affect the rays, and the important modifications in design and construction of tubes.

Tubes are spoken of as **hard**, **medium**, or **soft**, according to their penetrability by the current. A hard tube requires for its operation a greater number of **watts** ($1 \text{ volt} \times 1 \text{ ampère} = 1 \text{ watt}$) which is indicated by a longer equivalent spark at the parallel gap. A "hard" tube is one enclosing a high vacuum, while a "soft" tube has a low vacuum, that is to say, contains a greater number of air molecules. A hard tube emits a smaller quantity of rays than a soft tube, but of deeper penetration. It at the same time generally emits a small number of rays of low penetration, whereas all the rays emitted by a soft tube are of this character. Increasing the current through a tube not only increases the total number of rays emitted, but makes **some** of them more penetrating. To suppose that the same tube is less active therapeutically when brilliantly illuminated by an increase of current than when emitting a dimmer light, because in the former case it gives a clear fluoroscopic image showing more penetrating rays, would be an error, since, as we have just said, under such circumstances the **total** rays are increased, a large proportion of which are of the requisite degree of softness. These, however, are not detected by the fluoroscope. Soft or medium tubes are best adapted to radiotherapy.

It is important to note that the vacuum in a tube is a constantly varying quantity. As a rule, the longer a tube is used the harder it becomes; rarely the opposite occurs. If a tube be overdriven it will become rapidly harder, although sometimes when crowded until the target becomes red-hot it softens again. The reason of this will be apparent when we come to consider the subject of the regulation of tubes. Often a tube will vary in hardness, and, therefore, in the character of rays emitted, while being used, indeed, within a few minutes. Hardening is due to absorption of residual electrons by the anticathode and glass under the influence of bombardment.

The brass caps over the tube terminals will sometimes pull off. They can be easily stuck on again with a mixture of plaster of Paris and liquid glue. It is not necessary to

bring the wire which projects from the glass into exact contact with the cap.

Regulation of Tubes.—The operator should be provided with several tubes and change them from time to time. A tube which has become too hard for therapeutic efficiency will often improve on being laid aside for a few months. Heating tends to lower the vacuum by bringing about a liberation of the absorbed gas, thus explaining the occasional softening of an overdriven tube, as mentioned above. Some degree of softening may be obtained by carefully heating over a spirit or Bunsen flame, or baking in an oven at 300° F. for several hours. Many tubes have regulating devices attached to them, which may require the use of a spirit flame or be automatic.

The **osmoregulator** consists of a small tube at right angles to the shaft of the focus tube, into which is soldered a platinum wire; a removable cap fits over it. When it is desired to lower the vacuum, the cap is removed and the wire held in the flame of a spirit lamp or gas jet until heated to a cherry red. This makes it porous and allows hydrogen to pass from the flame through the wire into the tube.

Self-regulating Tubes.—In Müller's tube a second smaller chamber connects directly with the larger bulb. Into this smaller chamber are fitted a supplementary anode and cathode. The cathode terminates in mica plates between which is placed a substance which, on heating, will liberate gas. The anode terminates in a coil of fine platinum wire. To the cathodal end is fitted an arm consisting of a wire so jointed that its other end can be approached to the principal cathode or pushed away from it. Now when the vacuum within the tube is raised so that its resistance is greater than that outside the tube from the main cathode to the end of the wire, there is sparking across the latter interval. The current now being deflected heats the cathode in the lesser chamber and liberates gas until the vacuum is so lowered as to permit the passage of the current across the main tube. If the vacuum become too low, it can be again raised by connecting the positive wire to the secondary anode. The

circuit being closed, minute metallic particles are projected from the fine coil at the anode to the glass immediately about it, thus combining with and fixing a number of gas molecules, and consequently raising the vacuum.

The Sayen tube, made by Queen and Co., has the gas-producing compound in a small bulb connecting with the main tube, but separated from the auxiliary cathode by a closed chamber at a lower vacuum. When the wire from the auxiliary cathode is brought close to the main cathode terminal, discharge occurs through this chamber, heating the small tube and contained compound.

In the Thomson tube a small quantity of potassic or sodic hydrate is placed in an auxiliary bulb through which is sealed a platinum electrode. The latter may be heated with a lamp, or the device may be made automatic by bringing a wire from the electrode near the cathodic terminal. In all self-regulating tubes there is a danger of making the vacuum too low. Regulation is effected by leading the current away from the main terminals. This permits the target to cool off and occlude some gas. When the current returns to its usual path it is again heated and the gas liberated, thus bringing the vacuum lower than was designed.

Special forms of tube intended for work within the mouth or other cavities need not be here described. Most therapeutic work can be satisfactorily done with the smaller, simpler, and, therefore, less expensive tubes, but heavier targets will be required for use with coils than with static machines.

New tubes always work better than old; still, with care a tube may continue efficient for months. Inasmuch as all tubes tend to harden with age, and as soft or medium tubes are needed for therapy, a tube that is no longer suited to the latter purpose may be at its best for radioscopy or radiography.

The Tube Stand.—This should be of sufficient height to rest upon the floor and raise the tube to a maximum elevation of five feet; smaller stands for use on a table do

not allow a perfect adjustment of the tube to the surface to be rayed, and are likely to fall over. The base should be sufficiently heavy to make the whole quite secure. An extensible arm with a second joint should permit of changes of position in any direction. It is a good idea to carry the lead wires toward the ceiling between the coil and stand, so as to have them well out of the way.

Protection of the Patient and Operator.—It is of the highest importance that only those parts of the patient's surface which require them should be exposed to the rays. Fortunately this end is in all but rare instances easily secured. The more complicated devices originally devised have given way to the simple interposition of an opaque shield between the tube and patient. The simplest plan is to use sheet-lead $\frac{1}{50}$ to $\frac{1}{32}$ inch thick (Pusey), or thick tinfoil ($3\frac{1}{2}$ ft. to the lb.), in which is cut a hole of the desired shape and size. The shield should be large enough to cover all surfaces looking toward the tube and within a foot of it. The shields can be laid on the surface or bound to the part. A layer of non-conducting material on the under surface of the shield, except when working with hard tubes giving high external electrostatic effects, is an unnecessary refinement. There is no advantage in a "ground." There should be no sharp points or creases about the edges, as painful sparking may occur between such points and the skin. If the rays are directed to a point on the head or face, it may be necessary to protect the shoulders with a second shield. The above precautions will be sufficient in ordinary cases in which sittings are continued during one, two, or three months. When sittings are to be prolonged over many months, however, it may be desirable to use more complete protection to guard against the action of rays upon more distant parts of the body. The patient may under such circumstances be exposed to certain dangers which ordinarily threaten the operator only, to be mentioned later.

Another form of shield is supported upon an independent base or attached by an extensible arm to the upright shaft

of the tube stand. This form usually consists of a series of diaphragms of various apertures.

Best of all, perhaps, are the devices by which the tube is enclosed in a casing impervious to the rays, and with an opening opposite to the anticathode. This arrangement has the advantage of protecting not only the patient, but the other occupants of the room as well. A similar end may be accomplished by a simple box covered with sheet-lead and secured to the stand, as described by Dr. Stelwagon. A very satisfactory home-made arrangement can be made out of one of the pasteboard boxes in which tubes are sold. A hole is made in the bottom of the box so that a line produced through the anticathode will pass through its centre. Its cross diameter should equal half the distance from the anticathode to its centre. As the rays cut the bottom of the box at an angle, the hole should be an oval, its diameter parallel to the long axis of the box being somewhat the shorter. The lead wires pass through small holes at each end of the box. Two cross-pieces of wood secured across the top serve to fix the box to the horizontal arm of the tube stand. The box should now receive seven coats of white-lead paint, both inside and out. With a brilliantly illuminated tube the fluoscope will still detect some rays penetrating the fourteen coats of paint, but experience seems to show that the protection thus afforded is sufficient. This may be explained not only by the fewness of the rays which make their way through, but further by the fact that those few are of the more penetrating and less active sort—the less penetrating active rays being probably all blocked off. If desirable, diaphragms, or a funnel-shaped protractor, may be attached to the opening left for the rays. The top of the box may be left open, allowing the operator to see the tube and judge of its illumination. A sheet of aluminum interposed between tube and patient can only be of use in treating deep growths, where soft rays are not wanted.

Here should be mentioned Piffard's tube, made of a cobalt glass impervious to the rays, except where a window

of permeable glass is inserted opposite the anticathode, but not parallel to it. It is objected that here, as in Belot's "localizer," the most intense irradiation is cut off. The objection is less weighty than at first seems, since the number of rays diminish very slowly from centre to periphery (see p. 563). With such a choice of rays the inconvenient cathode shank is no longer in the way.

Protection of the Operator.—Every large city can show one or more physicians seriously crippled by the rays. Such examples give us pause. The lesson to be derived from them is, sedulously to avoid all unnecessary exposure, especially the dangerous, rash, not to say foolhardy practice of constantly using the operator's hand for a shadow test. The experienced man need only resort to this method at rare intervals, and then a glance should suffice. Another important point is to keep within that part of the room corresponding to the dark hemisphere of the tube. Even then some rays will reach the operator, and their accumulated influence during years of work may cause sterility, if not dermatitis or other tissue changes. It is, therefore well for him to provide some safe place to which he may retire, such as a lead-covered screen provided with a glazed window, or he may step just outside the door and around the partition wall, if the latter be not of wood, taking an occasional glance into the room. It is also well to wear a short apron of sheet-lead or tinfoil to shield the testicles.

The many devices in the way of lead or tinfoil armor, gloves covered with tinfoil, etc., are cumbersome and not practical. Buckskin gloves covered with a coat of lead paint are an insufficient protection. The various plans for enclosing the tube are a great protection to the operator. The impunity secured by caution is illustrated by Pusey's statement that neither he nor his assistants have ever experienced the slightest dermatitis. We can make the same statement, although one of us has given upward of ten thousand sittings in the last five years.

Choice and Dosage of Rays.—The effects of the rays upon living tissue depend upon two factors: the **quality**

of the rays, that is, their power of penetration, and the total **quantity** of these absorbed. The latter is determined by the **quantity emitted** by the tube, the **distance** of the latter from the surface, and the total **time** occupied in sittings. The time evidently varies as the number and duration of sittings.

Quality of the Rays.—Rays vary in penetration. As before stated, hard tubes emit comparatively few rays of high penetration, and soft tubes many rays of low penetration. The former are best adapted to radioscopy and radiography, and the latter to radiotherapy. The quantity being the same, “soft” rays, that is, rays of low penetration, will act more powerfully upon tissues, whether for good or ill, than “hard” rays, since the latter continue through the tissues with little change, whereas the former are absorbed by the tissues and thus liberate their energy in them.

One may judge of the degree of penetration of the rays by the **fluoroscope**, which consists of a screen covered with a substance fluorescent to the rays, of which barium platinocyanide is the best, placed at the larger end of a light-tight box, and viewed by the operator through an opening at the smaller end, so constructed as to fit accurately over the face around the eyes. With rays of low penetration, such as are desirable in all cutaneous therapy, the bones of the hand will throw a solid shadow on the screen, while the soft parts will show of a gray-green shade, the rest of the screen being well illuminated. If the bones show transparent, so as to reveal the differences in density between their shafts and extremities, the rays are too penetrating. The operator should avoid using his hand any longer or any oftener than is necessary in these determinations, lest he suffer serious injury. In practice, the experienced operator need rarely resort to this method while using a tube with which he is familiar. Hardening of the tube will be revealed, the voltage and ampèrage of the primary remaining the same, by sparking across the parallel gap.

A more exact method, however, was devised by Röntgen for measuring the penetration of the rays. His platinum-aluminum window is modified in the radiochromometer of Benoist.

This instrument is based on the facts that metals vary in opacity to the rays as their atomic weights, or, in other words, their densities, and that the ratio of their opacities varies with the penetrating power of the rays. Thus, quoting Belot: "Supposing aluminum is 5 times as transparent as silver for soft x -rays, it will be 10 times, 20 times, 30 times as transparent for rays of greater hardness.

"The radiochromometer is formed of a disk of aluminum divided into twelve sectors whose thickness varies from 1 to 12 mm. The aluminum disk is pierced by a central aperture in which is placed a plate of silver 0.11 mm. in thickness. The sectors are arranged like the figures on a clock face, thus enabling any one of them to be easily recognized by its position. No. 1 is in the position corresponding to one o'clock, No. 12 corresponding to that of twelve o'clock.

"The apparatus is used either in front of a fluorescent screen or above a photographic plate. In either case, one of the sectors will match the tint of the central disk. The number of this sector will indicate the radiochromometric intensity of the x -rays employed. This number will suffice to define the quality of the rays in question."

The measurements so obtained, however, only apply to the most penetrating rays emitted at the time. Besides these there are also present softer rays, for a focus tube gives out simultaneously rays of different degrees of penetration.

Quantity of Rays Absorbed.—The importance of determining the quantity of rays is evident from Kienböck's generally accepted dictum that, "The degree of reaction depends upon the quantity of x -rays absorbed by the skin." Of course, this is not the same thing as the quantity falling upon the skin, since the more penetrating rays are not absorbed to the same extent as those that are less so, but

in the absence of more exact knowledge we may take one of these quantities as an approximation to the other.

Distance.—The first factor to be considered is that of distance. This should properly be measured from the point of origin of the rays, that is, the anticathode, to the surface of the patient, and not from the outside of the tube. The *x*-rays, like all forms of radiant energy, obey the law of the inverse square, that is, their intensity (number of rays falling on a given area) varies inversely as the square of the distance. A practical deduction from this law, amply supported by sad experience, is that the tube should never be brought closer to the surface than is necessary to secure the desired effect. It is probably well to observe five inches measured from the anticathode, as a minimum distance, rarely to be approached. Earlier operators often worked with shorter distances, some even bringing the glass in contact with the surface, a practice which occasioned some disastrous results. As a general rule, it is said that the distance of the anticathode should be twice the diameter of the surface to be irradiated, but this rule will not apply to the treatment of very small surfaces.

When it is desirable to act through a considerable thickness of tissue a tube yielding a large number of rays placed at a greater distance will give better results than one yielding fewer rays brought close to the surface. By the former arrangement we secure greater uniformity of action throughout the depth we desire to affect, so that while those portions of tissue near the surface will receive no larger a dose than they should, those at a greater depth will still receive enough to be of benefit. The following illustration will make this evident: Suppose we arbitrarily call the volume of rays falling upon a given area at one inch from their source, 1. Then if such source be three inches from the surface, the volume of rays at the surface, by the law of the inverse square, will be represented by $\frac{1}{9}$, and for the same area at a depth of three inches, or six inches from their origin, by $\frac{1}{36}$. If now the point of origin be removed to a distance of six inches, the volume impinging on

the surface will be represented by $\frac{1}{81}$, while at a depth of three inches below the surface, or nine inches from the source of the rays, it will be only $\frac{1}{81}$. Now, in the first case, the volume at the surface is four times that at a depth of three inches, while in the second it is only two and one-quarter times as much.

At the first sitting the tube should not be nearer than six inches, and in most cases eight, and be gradually approximated at later sittings. Such at least, is, as we believe, the practice of most operators in this country. It is evident that no definite set of rules can be given to govern this point. The operator's judgment, based upon experience, will be the best guide.

The subject of distance will be further considered when we come to consider the question of the quantity of rays emitted by the tube (see p. 563).

Time.—The second factor affecting the matter of the quantity, or total number of rays absorbed by the patient throughout his treatment, is that of **time**.

In the absence of precise methods of measurement, such as were detailed in the last section, no definite rules can be laid down as to the duration or number of sittings, except that the first should begin with a minimum of say, five, or even, with a very active tube, two minutes, and be gradually increased to a maximum of ten, or, possibly, in exceptional instances, fifteen minutes. Eight minutes is about right for most cases. The proper interval between treatments will also vary according to the requirements of the case. Time and distance can evidently be made to balance each other. Thus, if a certain quantity of rays fall upon a given area within a certain time, with the tube at a certain distance, we can obtain the same quantity with a greater distance and longer time. Remembering the law of the inverse square, as applied to the first of these factors, we would correct its effect by multiplying the time by the square of the distance. Thus, if a certain effect is obtained at 3 inches in 8 minutes, we can secure the same at 6 inches (twice the distance) in $2^2 \times 8$, or 32 minutes.

The longer the sittings and the shorter the intervals, the greater evidently is the risk of injury from the rays. We are largely influenced in our judgment as to the degree of risk of injury to which it is proper to expose our patient by the gravity of the condition from which he seeks relief. Thus, it may be justifiable to expose an infiltrating and inoperable carcinoma to daily irradiations, while the same practice would be highly reprehensible in dealing with a hypertrichosis. Patients from the country or from distant cities will often urge us to give them daily sittings in order that they may the sooner return to their homes. At such times we should carefully keep in mind the ultimate welfare of the patient as the first consideration.

Patients entering upon a course of treatment quite naturally wish to know how many sittings will be required. Unfortunately we can at best limit our answer between a widely separated minimum and probable maximum, with a reservation in regard to the latter. The operator of experience can say that most cases of the sort in question have required no more than a certain number of sittings, but unless he be neither honest nor shrewd he will make the patient clearly understand that the rule presents many exceptions.

Quantity of Rays Emitted by the Tube in a Given Time.—

One can form a fair estimate of this important factor by the sharpness with which the illuminated hemisphere is cut off, and its brilliancy. Still more significant, perhaps, is the glow of the fluorescent screen. These data are, perhaps, sufficient to the trained worker for all practical purposes, and are generally so considered in this country. For more exact determinations, however, special methods have been devised. They are all based upon the chemical activity of the rays, and depend upon certain color changes in known media. Chief among devices for this end is the **chromoradiometer** of Holzknecht. This consists of pastilles containing a reagent, and a graduated color scale for comparison. Each shade of the scale is marked with a number expressing multiples of an arbitrary unit quantity of rays.

The symbol for this unit is H. There are twelve shades ranging from 3 H to 24 H. A pastille attached to a card, on which memoranda may be jotted down, is placed on the skin near the spot to be treated. The sitting is interrupted several times until the pastille shows a shade corresponding to the dose desired, as shown by the color scale, or several sittings may elapse before the desired shade is obtained. In the latter case the pastille should, between times, be carefully protected from the light. The same pastille may be used a number of times until it has attained the shade indicated by 24 H, when its color may be restored by exposure to the light. It, however, never completely recovers its original shade.

The objections to the method are the difficulty of determining the very slight differences in shade, the fact that the change does not always occur immediately (sometimes, indeed, the full effect is not visible until the next day), the fact that the effect of a given quantity of rays is not always quite uniform; the difficulty of obtaining the pastilles, their high cost, and the fact that their composition is kept a secret.

Freund devised a radiometer based on the change of color due to the liberation of iodine in a 2 per cent. chloroform solution of chemically pure iodoform. The solution will not normally retain its color more than twenty-four hours.

Sabouraud and Noiré's radiometer is made in the same manner as the screen of a fluoroscope; that is, it consists of paper impregnated with an emulsion of collodion and amyl acetate, containing barium platinocyanide. The paper grows darker on exposure to x -rays, and is compared with a water-color scale of 2 degrees, corresponding to zero and 5 H, the latter being the highest amount which can be employed without producing an initial erythema.

The paper is not to be placed on the skin, as are the Holzkecht pastilles, but half-way between it and the anticathode. The comparison with the scale must be made at once, as the paper rapidly loses its color on exposure to

the light. This method possesses several advantages over that of Holzknicht, chief among which are its non-secrecy and the fact that a fluorescent screen, which may be had at a moderate price, may be cut into several thousand pieces, each sufficient for an exposure, and each capable of being used as many times as one pleases, provided it be exposed to the light after each exposure until its original color is completely restored.

In the foregoing discussion reference has always been had to the largest quantity of rays emitted in any one direction at a given moment. This direction is in a line normal to the plane of the anticathode. From this central line rays diminish in quantity toward the limit of the illuminated hemisphere, the plane of which coincides with that of the anticathode. As we pass from the centre of the hemisphere toward its edge, the number of rays lessen very gradually, so that at a point 84 degrees around the quadrant the rays are still one-half of the maximum.

To say that at a given angle a certain proportion of rays are emitted does not mean, however, that rays reaching the irradiated surface along that angle when the plane of the target is parallel to that of the surface will bear the same proportion to the number received at the centre of the surface. Still less does it mean that the relative reaction at these two points would be expressed by the same figures. Far from it; the observed reaction diminishes much more rapidly from the centre to the circumference than these figures would seem to show. The reason for this is that two other important factors are here involved. The first of these is, that when the irradiated surface is approximately plane, the peripheral rays travel through a considerably greater distance before reaching it, and are, therefore, diminished in quantity by the square of that distance (the perpendicular distance being here the unit of measurement). The second factor is the law governing all radiations, that is, that their intensity varies as the sine of the angle of incidence. The latter, manifestly, diminishes as we proceed from the perpendicular. On a convex

surface both these factors are increased. Rays tangential to the surface are of no effect. A consideration of the law of the inverse square will make it clear that the closer the tube is to the surface the greater is the disproportion between the quantity of rays received at the centre and at the periphery. Belot calculates that when the distance from the anticathode to the surface is one-half the diameter of the surface, the periphery will only receive one-half as much as the centre; when the diameter and distance are equal, the periphery will receive three-quarters as much as the centre. When, however, the distance is twice the diameter, the periphery will receive almost as much as the centre. As the law of sines operates in the same direction, the obvious deduction is that the most equable distribution of rays is obtained by placing the anticathode at a distance equal to two or more times the diameter of the surface to be irradiated. If the surface be so large as to call for a tube distance which would require too long a sitting, it may be exposed a part at a time.

Dosage Concluded.—It is claimed by Kienböck and his school, that by applying the factors discussed in the preceding sections a dose of *x*-rays can be measured almost as exactly as a dose of medicine. These factors are quality and quantity.

Quantity in turn depends upon:

1. The number of rays emitted by the tube.
2. The distance of the tube from the surface.
3. Total time of raying.

It has been shown that there is a compensatory relation between the first two and the last of these elements.

As it is desirable to shorten the time of sittings we should be guided by the dictum of Holzkecht, that "The focus tube should be placed as close as is compatible with equable irradiation of the skin." This distance, we have seen, is not less than twice the diameter of the surface. We have already noted an exception to Holzkecht's rule in the case of a thick layer of diseased tissue.

Suppose that we are able to form beforehand an approx-

imate estimate of the total number of rays (expressed in H units) which the skin will have to absorb in order to effect a cure. The question then arises, Shall this amount be administered in one sitting? If not, in how many sittings and at what intervals? If the total amount called for is less than will excite erythema, it may be given at one sitting. Thus, Sabouraud treats *tinea tonsurans*, and, it is said, usually effects a cure, at one sitting. The dose needed here is one which will produce epilation without redness, 4 or 5 H.

In the case of neoplasms, however, the matter is not so simple. Here the total amount required would, at one sitting, produce severe dermatitis and ulceration. Evidently we must use "broken doses" and give at each sitting an amount short of what will produce a reaction. The interval should be sufficient to allow the normal tissues to recover their integrity. Belot says: "We are of the opinion that the exposure should be continued in spite of reaction, in the treatment of lesions such as epithelioma and sarcoma, in which the rays may be supposed to have an eliminating action. A certain degree of erythema, or even a slight inflammatory reaction, is of advantage in such cases."

The same writer fixes the maximum total dose at 10 H per month; others place it at 16 H.

According to Holz knecht, the doses for single sittings are as follows:

To produce epilation without redness of the healthy skin of the face, for young subjects 3 H, for adults 4 H.

To set up a reaction of the second degree, superficial erosion without ulceration or subsequent scarring, 5 to 7 H.

On flexor surfaces of joints, to produce reaction of the first degree, 4 to 6 H, and of the second degree, 6 to 8 H.

For extensor surfaces of joints, the trunk, scalp, palms, and soles: for the first degree 5 to 7 H, and for the second 7 to 14 H.

Where the skin is already inflamed from any cause, a reduction of 1 or 2 H should be made for a dose of 6 H, and for a larger dose a reduction of 2 or 3 H.

These and all similar set rules necessarily proceed on the assumption that all skins respond alike, or that idiosyncrasy, if it exist, is a negligible quantity. This assumption is rejected by most American therapists, who, in the interests of safety, use much smaller doses than these figures would indicate, dividing each dose, as given above, into several sittings. The effect is not the same, as the tissues tend to return to their former condition between times. Beck, however, is bolder, and after three tentative five-minute sittings, one week apart, proceeds to ten, twenty, or even forty-five-minute sittings repeated every other day, in obstinate cases even daily. The risk is great.

At the Broca Hospital, Paris, Belot gives the required dose at one sitting, or on two consecutive days. In the second case the two sittings would be considered as one dose. The object of dividing the dose into two such parts is not to lessen the reaction, for, indeed, it would have no such effect, but to spare the patient the fatigue of too prolonged a sitting. By the **required** dose is meant that dose which will either (1) be sufficient to cure, or (2) when (as in malignant neoplasms) such an amount is greater than the tissues will bear, the largest safe dose. Naturally, when such large doses are given, the interval is made longer than is usual on this side of the Atlantic. Thus, Belot allows ten to fifteen days to elapse, and in cases requiring very heavy doses, as in breast cancer, twenty days. Bécclère generally waits a week.

Kienböck employs maximum illumination of a moderately soft tube. If the lesion be small he places the tube very close. Of course, the time is correspondingly short.

He fixes upon a certain standard or "normal" exposure. By this he means a twenty-minute sitting with a medium soft tube at 15 to 20 cm. from the surface, emitting such rays as will give a good fluoroscopic image of the thorax at 60 cm. from the focus, and a radiograph in thirty seconds. Such a "normal" exposure may be divided into several sittings.

He makes little change in the quality or quantity of the rays, frequency of interruption, or tube distance, but relies almost altogether on the time element to regulate his results, the range being from five to fifteen minutes, about $\frac{1}{2}$ H being absorbed per minute.

Oudin uses a tube so soft as to give a parallel spark of 2 to 5 cm.; heats the anticathode to a deep, cherry tint, and brings the tube as near as will permit of the whole surface being treated and will just prevent sparking over to the skin. This may be as close as 5 and will rarely exceed 10 cm. (2 to 4 inches). The exposure is consequently very brief and should never exceed five minutes. He begins with one-half minute, two days later he gives one-half minute more, and so continues on alternate days, adding one-half minute each time until three minutes is reached. Then a week's interval is allowed, after which, in the absence of reaction, the same plan is followed, beginning with three minutes and increasing to a fixed maximum of five.

Belot's classification of methods may be tabulated as follows:

1. Short intervals continued until reaction or cure.
 - (a) Doses weak.
 - (b) Doses weak at first and gradually increased.
 - (c) Doses medium at first and gradually decreased.
2. Total indicated dose in as short a time as safety permits.
 - (a) Dose at one sitting.
 - (b) Dose at several sittings.

Most American operators follow the method (1 b) of gradually increasing the dose at short intervals. While many brilliant cures have been effected by this plan, it is none the less open to serious objections, both theoretical and practical. Since the period of latency is often prolonged, a continuation of treatment until reaction means that the patient receives several sittings more than are required (at the time) and, perhaps, more than are safe. There can be little doubt of the cumulative action of the

rays, so that by the time a mild erythema declares itself, the occurrence of severe ulceration may already have been ensured. It is true that by using small doses at, relatively, long intervals, this danger is reduced to a minimum, but this means a great waste of time and trouble. The method is open to the charge of being inexact and unscientific. It is, nevertheless, the method of choice for allaying subjective symptoms. We must admit that it has the sanction of some of the best authorities. Thus, Morton gives three *seances* a week, of six or eight minutes; Williams, two or three of from five to twenty minutes, with the tube at from six to eight inches. Stelwagon at first gives two sittings a week, of five minutes each, with the tube at ten or twelve inches. If after two weeks, there be no reaction or improvement, he increases the exposures to three a week, each of ten minutes. The distance, in case of a negative result, is further reduced to eight and, finally, five inches. If there be still no effect the time is increased to fifteen or twenty minutes.

Pusey uses a medium light and begins with exposures at 15 cm. from the surface to the wall of the tube. The distance is gradually reduced, so that after two weeks of daily sittings the tube is at 5 to 8 cm. The time is then increased so that by two weeks more it extends to fifteen minutes, which is his maximum. In case of urgent need he continues treatment in spite of moderate dermatitis, and even, in rare instances, of acute, weeping dermatitis.

The method of decreasing dose (1 c) is followed by many Europeans, such as Freund, Scholtz, Török, Gassmann, and others. The methods falling into the second group are more exact. Where the estimated total dose is more than is compatible with the integrity of the tissues, it is administered in fractions, so as to keep within safe limits.

Is the Production of a Dermatitis Necessary?—Most practitioners will, we believe, answer this question in the affirmative. Most would, however, agree that the dermatitis is not in itself curative, but serves as an index to the fact that a full dose (for the time) has been received.

Freund and Scholtz advocate short and frequent exposures repeated until a reaction is obtained. Kienböck is of the same opinion. According to him some affections of the skin are curable by a radiodermatitis of the second degree, producible by the absorption of 4 H, in one sitting of eight minutes. Other diseases require an acute dermatitis repeated every two months. In still other conditions he avoids an acute reaction, but endeavors to elicit a slow, chronic dermatitis, brought about by exposures of medium intensity, once a week. In still others, slight reactions repeated every two weeks are sufficient.

Morton does not cease treatment with the first appearance of reaction, but continues until the initial erythema deepens into a deep-red or dark-tan color. Once this tanning has been obtained, the skin can stand a much heavier dose without suffering damage.

Williams seeks to produce a slight dermatitis or pigmentation in malignant cases, but avoids it in benign conditions.

Stelwagon increases the length of sittings and diminishes the distance until he obtains improvement or a slight reaction.

Oudin systematically endeavors to produce an erythema and makes it the basis of his treatment, regulating the duration of exposures and intervals in accordance therewith.

Béclère seeks to avoid a dermatitis, except in the gravest neoplasms. His rule is to give as large an amount at a sitting, and to make the intervals as brief, as will fall just short of this result. This means, in his experience, one sitting a week.

If, however, we hold that the one and only essential factor is the total number of rays absorbed, we will agree with Belot when he says, "Radiodermatitis is not necessary for a cure. It is most often an accidental complication, sometimes a foreseen result, but very seldom a desired effect."

Effects of the Rays on Tissues.—As with other therapeutic agents, so with the x -rays, the effects produced vary

with the dosage. A weak therapeutic dose produces a stimulation of normal-tissue elements, or, at all events, of epithelial cells, evidenced, for example, by increased hair-growth. Larger or frequently repeated doses cause a degenerative change (from overstimulation?) of these same elements, which is more marked as these are more highly specialized. Thus, we have arrest of proliferation at the hair papilla, shrinking and separation from the bulb, and shedding of the hair. A long continuance or frequent repetition of the process will cause permanent atrophy of various structures of the skin, apparent through irremediable alopecia, general thinning and wrinkling of the irradiated surface, and an appearance closely simulating that of old age. This condition may supervene even when there has been no dermatitis. The absorption of rays, in sufficient amount, will elicit the phenomena of inflammation; these may be limited to erythema, a flush resembling that produced by sunburn, disappearing in a day or so without visible trace, or, if of higher grade or longer continued, accompanied by sensations of itching or burning, followed by scaling and tanning, or freckling. Telangiectases may develop, or a growth of downy hair. This constitutes the first degree of dermatitis. The second degree is characterized by the formation of vesicles or blebs and swelling of the parts, with much pain, healing commencing under favorable conditions, ordinarily in about two weeks. In other cases the inflammation may continue for months, with here and there abortive attempts at repair, and upon final healing leave the skin smooth, devoid of pigment, hairless, and very sensitive. The third degree is that in which there is destruction of tissue and sloughing. This may be superficial, presenting a thin, necrotic layer like a diphtheritic membrane, while in other cases it involves not only the entire thickness of the skin, but deep underlying structures. The "Röntgen ulcer," thus caused, is the gravest danger attending radiotherapy. It is often intensely painful, it discharges little, presents a grayish or brown floor, with tough, dry edges, and is most intractable

to treatment, some cases persisting for a number of years in spite of continuous treatment. The milder grades of dermatitis show the tissue changes common to inflammatory processes of corresponding severity, while those attended with deep destruction reveal obliterating proliferation of the vascular walls, thus explaining the incoercible nature of the affection. Deeper connective tissue, muscle, and cartilage are but little affected, although the bones, as, for instance, those of the metacarpus, may show thickening. Sometimes a first transitory erythema appears within a few hours and disappears in a day or less, to be followed a week or so later by a more active process.

The skin is affected by the rays more readily than are the deeper tissues, not only because it is the first to receive their impact, but because it is by nature more susceptible. This is shown by the occasional occurrence of reaction at the point of emergence of the rays as well as at their point of entry, the intervening tissues remaining unaffected.

The phenomena of reaction resulting from the long-continued repetition of small doses are not the same as those observed after a single, large dose, or several such given at short intervals. The former present the characters of acute inflammation, while the latter, oftenest seen on the persons of operators, are chronic or degenerative. The hand is most frequently affected. In some cases the first symptom is a fall of hair, while in others there is capillary paresis, the fingers becoming dark red or bluish, and their integument dry and coarse.

Later the skin becomes glossy, atrophic, and wrinkled, or in other cases thickened, stiffened, cracked, and pigmented. The condition is sometimes like that in xeroderma pigmentosum, showing erythematous spots, freckles, scaling, telangiectases, keratomata, and, finally, in some cases, epithelioma. The nails are usually fissured and striated, or may be altogether lost.

The cumulative action of the rays is well marked. Reaction will follow a series of exposures, no one of which could have had this result, even when they are separated by an

interval sufficient to allow subsidence of all phenomena. A fact of similar significance is that dermatitis is long afterward easily excited on a surface once so affected. A curious and hitherto unexplained characteristic of radio-dermatitis is its **period of incubation** or latency. In a general way this varies in length inversely as the severity of the exposure. Sometimes showing itself in twenty-four hours or less, the dermatitis is often delayed for a week, reaching its maximum one or several weeks later. The great majority of cases are apparent within a fortnight, although numerous instances of much longer latency have been reported. Oudin mentions one of five months, ulceration lasting a year, and one of ten months, which in the next sixty days ran through all the stages of vesiculation, ulceration, and sloughing. One of us observed a dermatitis of the second degree about the face, accompanied by severe general symptoms, and diagnosticated by a competent physician as erysipelas, which came on four months after the last raying. It healed kindly, but recurred two months later without there having been any further exposure to the ray. In 3 cases observed by Pusey, relapse occurred after the same interval of time. Atrophy and telangiectases may be delayed a year or eighteen months. A fact, analogous to the latency of dermatitis and equally obscure, is the occasional first evidence of improvement in neoplasms weeks or months after suspension of treatment.

Blondes are more subject to the influence of the rays than brunettes, as they are to other forms of radiant energy. This difference is easily accounted for by the fact that the pigment of the skin occludes a portion of the rays. Children are more susceptible than adults. That certain regions of the body are more so than others is affirmed by Holzknecht, but denied by Pusey (see p. 565). There also exists, in certain individuals, a special susceptibility for which no cause can be assigned, and which is spoken of as **idiosyncrasy**. This is strenuously denied by some.¹

¹ See MacLeod, *British Journal of Dermatology*, 1903, p. 365, for an excellent review of the pathological action of x-rays.

This question of the existence of an idiosyncrasy is one of great practical importance. If we hold with Kienböck, that "individuals in good health react in precisely a similar manner to x -radiance," we must logically accept his hard and fast rules for dosage. If, on the other hand, we agree with Pusey that "there is no evidence to justify such a statement," we shall, like him, adopt a far more cautious technique. To our minds the facts all support the latter contention.

Dermatitis is occasionally accompanied by constitutional symptoms, such as headache, lassitude, nausea, and some elevation of temperature. Marked effects on other and deeper tissues, such as blindness, abortion, and paralysis, have been experimentally produced on small animals. Such effects have not been noted on the human subject. The relative immunity of the human eye is indeed remarkable, as, for instance, where a dermatitis of the lids with vesiculation has occurred without injury to the organ beneath. So with the central nervous system. One of us had the opportunity of subjecting this matter to a thorough test. A young man presented a circular aperture, four inches in diameter, at the vertex of the cranium, due to a deep burn in infancy. The brain within this area was devoid of other protection than its membranes and a layer of scar tissue. Within this scar there developed a carcinoma, which when first seen overlapped the bony defect at all points. This was subjected for weeks to daily quarter-hour raying from a powerful tube, with the anticathode perpendicular to the centre at a distance of six and one-half inches. At no time was any effect on the cerebrum discernible.

There is no question, however, of the sedative effect of the rays on peripheral nerves.

Before leaving the subject of the mode of action of the rays we may ask whether they are bactericidal. This question has received both positive and negative answers. The truth seems to be, that, whereas destruction of low forms of organic life, or an arrest of their growth, may be experimentally obtained in the laboratory by massive doses

of the rays, no such effect can be obtained within safe therapeutic limits. It should be mentioned, however, that Pusey, one of the best American radiotherapeutists, still holds to a bactericidal effect therapeutically obtainable.

For the **treatment of radiodermatitis**, see p. 186.

In the earlier portions of this work, the indications are given for the use of the *x*-rays in the following diseases:

Acne rosacea, acne varioliformis, acne vulgaris, actinomycosis, alopecia, alopecia areata, angioma, blastomycosis, callositas, carcinoma, cicatrix, clavus, comedo, cornu, dermatitis papillaris maligna, eczema, eczema seborrhoicum, epithelioma, epithelioma multiplex benignum cysticum, favus, herpes zoster, hyperidrosis, hypertrichosis, ichthyosis, keloid, keratoderma palmaris et plantaris, keratosis follicularis, keratosis senilis, lepra, leucoplakia, lichen planus, lupus erythematosus, mycosis fungoides, nævus pilosus, parapsoriasis, prurigo, pruritus, psoriasis, rhinoscleroma, sarcoma, scleroderma, scrofuloderma, tinea tonsurans, tinea barbæ, tuberculosis disseminata, tuberculosis ulcerosa, tuberculosis verrucosa, ulcerus, urticaria pigmentosa, verruca necrogenica, verruca vulgaris, vitiligo, xanthoma, and xeroderma pigmentosum.

RADIUM.

The year following Röntgen's discovery, Becquerel found that uranium and its salts spontaneously gave off certain rays which possessed the properties of (1) acting on a photographic plate; (2) exciting phosphorescence, and (3) ionizing the air (making it a conductor). Substances giving off such rays are said to be **radio-active**, and the rays are known as **Becquerel rays**.

Uranium occurs chiefly as an oxide in pitch-blende. From some tons of this mineral, M. and Mme. Curie obtained a few decigrams of a salt of an element which they called **radium**. Its radio-activity is about one million times that of uranium.

Radio-active substances give off three forms of energy, designated as α , β and γ rays. The first of these exert almost the whole ionizing power, but are otherwise feeble. The second are very similar to, and possibly identical with, cathode rays. The third closely imitate x -rays. Radium also gives off gaseous substances called **emanations**. They are themselves radio-active, and impart this property to solid substances with which they come in contact.

Radium is a spontaneous source of heat, light, and electricity.

As metallic radium is unstable in the air, only the chloride and bromide are available for use. In practice these are often diluted with other salts, such as barium chloride. These exist in varying proportions in the specimens sold for therapeutic use. Their radio-activity is expressed as so many times that of uranium, and is estimated by the rapidity with which they discharge a gold-leaf electroscope, the standard unit of time being that required for the discharge of the electroscope by metallic uranium. According to Allen (1904) specimens offered on the American market vary in radio-activity from 1000 to 300,000. Pure radium bromide registers as high as 1,800,000. Williams says that this is none too strong.

It was soon found that carrying radium about the person resulted in dermatitis, sometimes of a severe character. Three grades of burn are recognized, virtually identical with the three grades of x -ray dermatitis.

The method of application is simple. The salt may be enclosed in a box or capsule of aluminum, or in a glass tube, and bound to the part, or placed at a certain distance if a weaker action is desired. For still weaker effects it may be diluted with some inert substance, such as barium chloride, and enclosed in a caoutchouc bag.

Strassmann has used this agent with complete or partial success in lupus erythematosus (3 cases), lichen planus, rosacea, and vascular nevus. For its use in epithelioma and other affections, see Part I.

PHOTOTHERAPY.

The therapeutic value of the rays of the sun were known before Malachi spoke of his rising "with healing in his wings." Their effect was ascribed wholly to the heat and light conveyed, until toward the end of the eighteenth century, when Scheele and others showed the existence of chemical rays capable of reducing silver salts. In 1801 Ritter showed the existence of heat rays below the red end of the spectrum and chemical rays above the violet. Soon after the introduction of the electric arc light there were observed effects upon the skin similar to sunburn. These were shown by Charcot to be due to the chemical rays which this light contains in even greater abundance proportionately than that of the sun. Various attempts were made to utilize these rays in the treatment of disease, but nothing was accomplished in a systematic or rigidly scientific way until the researches of Niels Finsen, of Copenhagen, whose early loss the world still mourns.

Phototherapy is either **positive** or **negative**. In the former the chemical rays are selected and concentrated upon the region to be influenced. In the latter these rays are excluded. In this way an inflamed surface may be spared undesirable stimulation.

The light spectrum is overlapped by the heat spectrum at its lower or red end, and by the chemical spectrum at its upper or violet end. Thus by shutting out all the rays above the orange we can exclude the chemical spectrum, and by shutting out all below the blue eliminate nearly all the heat. Violet light, as a matter of course, contains no more active rays than does white light, since white light contains all, but the light rays below the blue are accompanied with so few chemical rays as to be worthless for therapy, while the admission of the large number of heat rays, from the yellow to the red, and below, would make the method impracticable. The chemical rays accompanying blue light are fewer than those in the violet and ultraviolet,

but more penetrating. Penetration increases through green, yellow, and orange, and is greatest in the red. Bie showed that the bactericidal power of light extends throughout the spectrum, although only 4 per cent. of it is in the red, yellow, and green, the other 96 per cent. being exercised in the blue, violet, and ultraviolet.

Negative phototherapy was advised by Finsen in the treatment of smallpox. His premises are: first, that the distress and peril of the patient vary directly as the amount of suppuration; and, second, that the amount of suppuration varies directly as the number of chemical rays which reach the skin. Accordingly none but red light is allowed to enter the sick-room. The method should be rigidly applied in order to obtain the results claimed by Finsen, namely, the elimination of suppuration and, therefore, of the fever of suppuration. The patient should be introduced into the red-room from the first appearance of the eruption. The room should be as carefully guarded from all but red light as is a photographer's developing room.

Finsen considered that the method was imperfectly applied if an exposed sensitized plate showed blurring. The method thus strictly applied gave good results in his hands. It has been employed in measles and erysipelas as well.

Positive Phototherapy. Apparatus.—Besides the lamp designed by Finsen and used at the Lysinstitut, a host of modifications and imitations have come into existence, the best of which are decidedly inferior to Finsen's model, while many are absolutely useless and constructed in defiance of scientific laws. We deprecate the looseness with which some writers speak of their results with the "Finsen treatment" when they have, perhaps, never come within a thousand miles of a Finsen lamp.

Finsen's apparatus consists of an 80-ampère, 50-volt arc light enclosed in a circular box some six or seven feet above the floor. From this box four telescopic tubes radiate downward and outward. In each tube are several condensing lenses, 7 cm. in diameter, for the purpose of concentrating the rays and thus ensuring their deep penetration. Inas-

much as glass is opaque to ultraviolet rays, the lenses are all made of rock-crystal or quartz. As the lower end of the spectrum is not excluded, it is necessary to provide for the absorption of heat. This is secured by filling a section of the tube between two lenses with distilled water. Besides this, the tube is surrounded by a hollow jacket in which ordinary water circulates. The patient lies upon a couch with the part to be treated six or seven inches below the lower end of the tube. An additional detached condenser consisting of two lenses united by a circular metal band, while an in-and-out flow permits the circulation of water between them, is firmly attached to the affected surface and further maintained in place by an attendant. This additional condenser serves the double purpose of further absorbing the heat rays and by compression driving the blood from the part, facilitating penetration. A solution of copper sulphate was formerly used in the tube instead of distilled water. An area one-half to one inch in diameter may be treated at a time. An ordinary sitting lasts an hour, with the extremes at one-half and twice that length of time.

The Finsen-Reyn lamp, used at the same institution, is a smaller model operated with a 20-ampère arc, and is practically the same thing except in its lower power and the mechanical details of its construction. Instead of being suspended from the ceiling, the apparatus is secured to a standard mounted upon a heavy base. But one patient can be treated at a time.

Another type, which includes the Lortet and Genoud and the London Hospital lamps, discards the telescopic condensing lenses and brings the arc light as close as two inches from the patient. Between them is interposed a saucer-shaped, hollow metallic shield, at the centre of which are fitted two lenses separated by an interval. Cold water circulates between the lenses and within the shield. The patient presses the diseased area against the outer lens. While this lamp brings about an erythema more rapidly than does Finsen's model, it is deficient in penetrating rays, and, therefore, far less efficient.

The Bang lamp, which has water-cooled, hollow-iron electrodes furnishing abundant ultraviolet rays, also produces a rapid surface effect, but is even poorer than the last in deep rays. The Dermo lamp is a modification of Bang's. Piffard and others, inspired by the exceeding richness of the electric spark in ultraviolet rays, have constructed small lamps in which sparks pass between four or five close-set metallic knobs. The apparatus is to be held close against the skin. The action is very superficial.

The mercury-vapor lamp, originated by the German electrician Aarons, and improved by Hewitt, of New York, emit few or no red rays, but is exceedingly rich in the blue, violet, and ultraviolet. The latter, however, are largely absorbed by the glass of the tube. Schott makes a glass, believed to be of barium-phosphate-chrome, which is pervious to the chemical rays. This he employs in the "uviol" lamp (contracted from *ultraviolet*). This lamp has been successfully used for some time by various German workers and in this country by Dr. Schamberg, of Philadelphia. The latter has found this light to be of service in alopecia areata, leg ulcers, and certain forms of eczema.

The various incandescent lamp arrangements on the market need not be discussed in an article on phototherapy, inasmuch as this light is very poor in active rays, to which, besides, glass is opaque. A very large incandescent lamp may be of some use as a source of heat. Of course the use of a blue or violet globe only makes the apparatus, if possible, more useless. All that the color of a transparent medium can do is to subtract rays. It cannot possibly add anything. But a blue color in a medium like water, transparent to chemical rays, may be of use in absorbing excessive heat rays.

Technique.—Finsen laid great stress on the importance of rendering the part exsanguine by pressure. Jamieson substituted the application of the 1 to 1000 adrenalin chloride solution. Piffard drives this solution into the tissues by cataphoresis.

The average sitting with the Finsen lamp lasts one hour. G. H. Graham believes that the action of the light can be enhanced by the injection of fluorescent bodies such as esculin.

Action.—Redness appears from one to twenty-four hours after the sitting. Generally there is edema, exudation, and crusting, sometimes vesication. These subside in a week without leaving a scar. There is dilatation of cutaneous bloodvessels with leukocytosis. Proliferation of blood-vascular endothelium, increased epithelial mitosis and increase in the number of connective-tissue cells, with swelling of the collagen, have been noted.

The beneficial effects of phototherapy seem to depend upon (1) the excitement of inflammation which the diseased tissues are less able to withstand; (2) stimulation of the surrounding healthy tissue; (3) destruction of bacteria. The last-named effect is quite well established.

Phototherapy has been used with benefit in acne vulgaris, acne rosacea, alopecia areata, epithelioma, lupus erythematosus, naevus vasculosus, vitiligo, eczema, chronic ulcer, actinomycosis, sycosis, psoriasis, pruritus, and lupus vulgaris. In the last-named disease it has won its greatest triumphs. To the comparative rarity of this disease in America is due the fact that the method has never come into wide use here. Kromayer reports startling results in alopecia areata, using an iron-electrode lamp. Indications for the use of phototherapy will be found in the articles on the various diseases in Part I of this work.

ASEPSIS AND ANTISEPSIS.

The rigid rules of asepsis in the preparation of the field of operation, so necessary in major surgery, are rarely imperative in the minor procedures practised by the dermatologist. Thorough cleanliness and swabbing with a 1 to 5000 mercuric chloride, or a 2 per cent. carbolic solution are usually sufficient. On the other hand, all instruments

should be scrupulously sterilized and the disinfection of the operator's hands practised as a matter of routine.

ANESTHESIA.

Local anesthesia, for minor surgical procedures, may be obtained by freezing, or by the intradermic injection of cocaine or one of its congeners. The methods by the application of carbolic acid, the high-frequency current, etc., are too unreliable to merit discussion.

Freezing Methods.—These are virtually limited to the ether and ethyl chloride sprays. The first may be applied with an ordinary atomizer. Its effect is obtained more rapidly by placing small wisps of cotton on the skin, thus increasing the surface for evaporation. While efficient, it is open to a serious objection from the inflammability of the agent, making its use dangerous in connection with the thermocautery. Ethyl chloride is far safer as well as more convenient. It may be had in glass bulbs furnished with a vent controlled by a lever within easy reach of the operator's thumb.

All freezing methods are open to certain objections. In the first place there is some pain during congelation, but usually more later, while the region is thawing. At this time, too, there is some increase in the tendency to hemorrhage. These matters are not serious, but what is more worthy of consideration is the attendant alteration in the color and hardness of the tissues, so that the limits of the lesion can no longer be appreciated by the eye or hand. In most work with the curette this is a fatal objection, as the operator is generally chiefly guided by the degrees in resistance of the tissues. The method is better adapted for use with the cautery, or when a single incision is required, as in laying open a small abscess. In such cases it is well to begin by outlining the area to be operated on with ink or a dermatographic pencil. An ordinary aniline pencil, moistened, answers very well.

Endermic Injection.—Medical literature records many fatal accidents from the use of cocaine for local anesthesia, while in a far larger number of cases there developed alarming symptoms, death being averted only by the prompt action of the physician. These accidents are due (1) to the use of solutions of unnecessary and dangerous strength; (2) to the use of too large a quantity of the solution; (3) to the solution being injected hypodermically and not, as it should be, endermically; (4) to the untoward condition of the patient. We will review these factors *seriatim*.

1. Excessive strength of the solution. We believe that the solutions generally used are far stronger than need be. The French surgeon Reclus, as long ago as 1893, published a list of 2000 operations performed under complete analgesia, most of them with a 1 per cent. solution of cocaine, and in rare instances one of 2 per cent. The latter strength was never exceeded. In no case were there any bad symptoms.

2. Quantity of solution used. When injection is carefully made **into** the corium and not beneath it, not only is the result obtained more rapidly and more completely, but, what is even more important, with a much smaller quantity. Even so, however, diffusion occurs into the circulation. We should remember that we are dealing with a potent agent and should, therefore, accurately measure the dosage. It is a good rule never to take up into the syringe more than the maximum dose we have determined to employ. The minimum **fatal dose** of cocaine to the adult is certainly not more than $\frac{1}{2}$ gr. **This amount is contained in 8 minims of a 4 per cent. solution; 8 minims of a 2 per cent. solution should be the maximum dose, to be rarely employed.**

3. Manner of injection. This was mentioned in the last paragraph and will be further elucidated below.

4. Condition of the patient. Among counterindications are organic or serious functional disease of the heart, hysteria, and profound neurasthenia.

Among the toxic symptoms of cocaine are pallor, profuse perspiration; frequent, feeble, irregular, or intermittent pulse; unconsciousness, dizziness, nausea, blindness, deaf-

ness, muscular rigidity, lividity, convulsive or suspended respiration, and paralysis. Upon the supervention of any of these, the patient should be placed at once in the full recumbent position, with the head lower if possible than the rest of the body, and restoratives applied, such as ammonia, alcohol, nitroglycerin, digitalis, strychnine, and atropine. It may be necessary to use artificial respiration. As in morphine poisoning, it is not safe to leave the patient for some time, even after apparent recovery, as a second or even a third collapse may occur.

The "infiltration anesthesia" of Schleich is a great advance, inasmuch as with its use one can keep entirely within safe limits, and yet do all that can be done with the stronger solutions. For moderately hyperesthetic areas Schleich uses his "normal" solution:

R—Cocainæ hydrochloridi	gr. ij
Morphinæ hydrochloridi	gr. ss
Natrii chloridi sterilizati	gr. iv
Aquæ destillatæ sterilizatæ	f 3iv
Adde:	
Acidum carbolicum	gtt. ij—M.

For areas the seat of inflammation, neuralgia, etc., he uses a solution containing twice the proportion of cocaine given above.

Schleich insists that the injections should be endermic and not hypodermic. Inasmuch as we have absolutely no right to inflict unnecessary pain, we should use only the finest of needles, such as those made by Green. The puncture, made almost horizontally, is not to extend below the corium. A blanching and slight swelling about the point as soon as pressure is made upon the piston, together with the resistance encountered by the latter, announce the success of the little maneuver. The needle is withdrawn after a few seconds, reintroduced just within the edge of the blanched area, and a second injection made just beyond the first. By repeating this process, as often as necessary, we soon obtain an anesthesia lasting ten minutes or longer. The patient need feel only the first puncture.

Of the many substances brought forward as substitutes for cocaine, only one is satisfactory, namely, eucaine B, probably the best local analgesic known today. It is less poisonous than cocaine, less irritating to the tissues; its solutions will keep longer, and may be sterilized by boiling without change. Its anesthetic power is equal to that of cocaine and lasts as long. Braun, who has done so much in this field, advises a solution containing 1 part eucaine B and 8 of sodium chloride to 1000 of water.

A late analgesic, alypin, is not properly a substitute for cocaine, but gives the best results in combination with it. Schleich uses for infiltrations: \mathcal{R} —Cocainæ, gr. ij; alypin, gr. ij; sodii chloridi, gr. iv; aquæ destillatæ fl., \mathfrak{z} iv.

THE CURETTE.

This little instrument occupies a wide field of usefulness in dermotherapy, both as employed alone and to prepare the way for other agents. In lupus, small epitheliomata, molluscum contagiosum, and in pustular acne, its use is rapid, easy, and efficient. It may be used for the removal of warts and small papillomata, although with them not the method of election. The hand soon learns to distinguish between the degrees of resistance offered by diseased tissue as compared with normal, thus acquiring an easy and safe guide. The tissues should be put lightly on the stretch. Several sizes and shapes of curettes should be at hand, so that the greater part of a lesion may be rapidly removed with a larger and broader instrument, and the operation completed with a smaller and narrower one, which will permit the thorough cleaning out of all pockets and recesses. The minute instrument used by ophthalmologists will sometimes be useful at the final stage. Ring and crescent-shaped curettes are better than those with a solid bowl, which may occasion delay by the scrapings packing into the concavity.

Curetting alone is sufficient for the removal of lesions

showing little tendency to recurrence. In dealing with lupus and epithelioma, on the other hand, it is usually necessary to follow it up with a chemical or thermocautery. A preliminary partial curetting, before resorting to the *x*-rays, may save much time, especially in dealing with sclerosed lesions.

The usually slight resulting hemorrhage will generally yield to a minute's compression with a pledget of gauze. If it persist, adrenalin chloride, 1 to 1000, may be used. This invaluable styptic should always be at hand. One should not forget the existence of hemophilia. We should, therefore, enquire as to our patient's past experiences in the matter of bleeding, and in suspicious instances be provided with powerful styptics such as the perchloride or subsulphate of iron, and a thermocautery.

Rigid asepsis of the instrument is at all times essential. Thorough cleanliness and mopping with one of the ordinary antiseptics will suffice for the field of operation. When an anesthetic is to be used, cocaine or Schleich's solution should be preferred to any freezing method, as the latter robs us of the valuable guide furnished by the degree of resistance of the tissues.

The choice of dressing after operation will depend upon the nature of the lesion. Thus, a salicylic plaster may be used after the removal of warts or papillomata, while spirit of camphor is recommended in molluscum contagiosum. In malignant and tuberculous lesions, after the fall of the eschar produced by the usual cauterization, we may use ordinary healing applications, such as boric acid, aristol, iodol, or euophen.

THE SCARIFIER.

In dermatology, the term *scarification* is used in a limited and precise sense to denote a certain minor surgical procedure, which consists in making a series of close, parallel incisions into a diseased area, intersected at an acute angle

by a similar series, so as to leave a number of minute lozenge-shaped figures. A third and even a fourth series may cross these at various angles. The method has found its chief application in lupus vulgaris, but has also been employed with more or less success in lupus erythematosus, the first and second stages of rosacea, vascular nevi, keloid, hypertrophied cicatrix, and inveterate anal and vulvar pruritus.

In lupus, it gives the best and occasionally brilliant results in rapidly destructive forms; is less efficient in simple ulcerous lesions, and least so in the non-exedent type. A thin-bladed knife is lightly grasped so as to permit the hand to appreciate the varying degrees of resistance offered by the tissues, and the incisions made as close set and as rapidly as possible, extending them a little into sound tissue at each end, and sinking just beyond the soft lupic layer. Several series of cross-sections should reduce the tissue to a bloody pulp. Strangely enough, the area thus treated does not slough, but soon becomes reorganized and partly cicatricial. The obliteration of a number of capillaries and small vessels thus ensured, so lowers the nutrition of tuberculous foci as to determine their absorption. After waiting for healing and the subsidence of reaction, the procedure is repeated. This is done several or, it may be, many times. A simple antiseptic may be applied after the operation. Taking it for granted that the blade is perfectly clean, we may say that strict asepsis of the field of operation is not essential and that, as a matter of fact, sepsis does not occur. The cicatrices obtained in this way are especially soft and smooth.

In lupus erythematosus the measure is of doubtful utility, and may be an infringement of the precept *non nocere*. In rosacea it is better adapted to the destruction of dilated and varicose venules than to the earlier generalized blush. It is much more formidable than electrolysis and probably affords no larger proportion of lasting cures. No marked effect need be expected in keloid, although, according to Brocq, the pains are thereby greatly lessened. In vascular

nevus the method is inferior to electrolysis. For its indications in pruritus, the reader is referred to that article.

Balmanno Squire devised a multiple scarifier consisting of a number of parallel blades. It has never come into general use. It is, indeed, impossible with this instrument to suit the depth of the incisions to that of the infiltration, nor can it be thoroughly cleaned.

THE CUTANEOUS PUNCH.

This little implement, also known as the cutaneous trephine, devised by Watson and later advocated by Keyes, consists of a small, steel cylinder presenting a cutting edge at one end and open at the other, mounted on a shank and fitted to a straight handle. Various sizes range in diameter from that of a pin's head to one-third of an inch. With it small disks of skin can be punched out, using simultaneous downward and rotary pressure, the little plug being then snipped off with small, curved scissors. Its chief use is probably in the removal of pieces of tissues for examination, although it also finds a therapeutic application in tattoo marks, powder stains, and minute lesions of various sorts.

Kromayer's plan of driving the instrument by a small engine will never become popular. He not only uses this method in those conditions to which the hand punch is applied, but employs it in hypertrichosis, excising a small cylinder of tissue containing the follicle.

THE COMEDO EXPRESSOR.

The instruments named after Clover, Unna, and Piffard are virtually the same, the last named possessing a slight advantage in its American elegance of shape and convenience. They consist of a shaft bearing, at each end, a small cup or spoon-shaped expansion, at the centre of which is a perforation, to be fitted over the comedo while

pressure is applied. The perforations should not be of the same aperture. Two such instruments, giving apertures of four sizes, will be ample for all purposes. A slight rocking motion often aids in dislodging the little mass, or a fine wire, such as is carried in a hypodermic needle, may be passed down into it and thus loosen it. One should be careful not to bruise the tissues. In working near the eye and at the border of the jaw the left hand may be used to guard the instrument from slipping.

Schamberg's expressor terminates in a wide loop. It is not apt to become fouled during use, as will sometimes occur with the older instruments.

The punch-shaped, cylindrical expressors are almost as objectionable as the watch-key which suggested their construction.

THE ACNE LANCET.

This consists of a small, triangular blade furnished with a shoulder to prevent its being introduced too deeply. The manner of its use is detailed in the article on Acne. It is often advisable to have the patient procure a lancet and expressor, and instruct him in their use.

THE EPILATING FORCEPS.

This forceps, until recently sharing with the acne lancet and comedo expressor the first place in point of usefulness in the armamentarium of the dermatologist, is now in danger of falling into comparative desuetude through the daily increasing use of the *x*-ray as an epilating agent. It is, however, too useful ever to be wholly laid aside. In electrolysis for hypertrichosis it serves to discover the success or failure of the operation and to lift out the hair. It will doubtless still be used in some cases of tinea of the scalp and beard, and of sycosis. It is of service in alopecia areata, in clearing out the marginal hairs, a procedure of undoubted value.

The forceps should have an easy spring and perfectly smooth, opposing surfaces. Two shapes are useful, one with broad ends terminating in straight borders with which several hairs can be seized at a time, and another with a narrow blade terminating in a convex border, for single hairs.

Small mouse-tooth forceps are convenient for dislodging pediculi from the cilia.

THE THERMOCAUTERY.

The actual cautery, so called, which played almost a preponderating part in the surgery of the middle ages, is little used today, having been replaced first by the Paquelin and later by the galvanocautery.

It was formerly objected against the Paquelin instrument that even the smallest points were too bulky for some of the delicate work demanded in the destruction of the smallest lesions. This defect is remedied in Unna's microcautery, in which a small wire is soldered to the point of the instrument, thus permitting of effective, although sharply limited action. The Paquelin cautery is a most acceptable agent when there is no supply of electric energy at hand. With it, as with the galvanocautery, one may regulate at will the degree of heat employed.

The galvanocautery, however, is more convenient for office and hospital practice in cities and towns. Its advantages are, that one may select the size and shape of point desired, that it may be managed with one hand alone, that it is less cumbersome, thus admitting of greater precision, that the heat need not be turned on until the instrument is in contact with the lesion to be destroyed and can at any time be turned off, and that it is always ready for use at a moment's notice. It may be operated by a galvanic battery of low internal resistance, by storage cells, or by plugging directly into the public supply, taking care to interpose a sufficient resistance.

Whatever the nature of the cautery, we should remember the danger of causing deeper and more extensive destruction than is intended. The point should, therefore, probably never be heated to more than a cherry red. On the other hand, if allowed to cool much below that point, the instrument will adhere to the tissues.

Where only a single, rapid application is necessary we may dispense with anesthesia; otherwise we may employ cocaine endermically, or freezing by ethyl chloride. If the latter agent be used, the area to be destroyed should first be outlined with ink or an aniline pencil.

SKIN-GRAFTING.

The method devised by Thiersch has virtually displaced the older and slower procedures. It consists in the implantation of long and wide grafts, which include a layer of corium, upon a granulation-free surface. Deformities that would otherwise result from the healing of the wound, by granulation and consequent contraction of the scar, may thus be prevented, and large surfaces can be rapidly healed. In Reverdin's method, in which small grafts limited to the epidermis are implanted upon a granulating surface, contraction of the scar takes place.

The operation consists of the following steps: (1) Preliminary preparation of the surface to receive the grafts; (2) preliminary preparation of the surface from which the grafts are to be taken; (3) final preparation of the surface to receive the grafts; (4) removal of the grafts; (5) application of the grafts; (6) subsequent dressing. Success will chiefly depend upon strict asepsis, especially in carrying out the first two steps.

Preliminary Preparation of the Surface to be Grafted.—In the case of a fresh operative wound, no especial preparation is demanded beyond the maintenance of asepsis. A granulating surface should be thoroughly washed on several alternate days, first with soap and water, and immediately

after with a solution of mercuric chloride. After washing, it is dressed with gauze soaked in Peruvian balsam. When the granulations are firm, smooth, and red, the operation may be undertaken. Appropriate internal treatment will greatly aid in securing a healthy surface.

Preliminary Preparation of the Surface from which the Grafts are to be Taken.—An arm or thigh may be chosen, either of the patient or of any healthy individual. The anterior surface of the thigh is the site of election. An abundant hairy growth is no counterindication, as the grafts do not include the hair follicles. The day before the operation the site is shaved, thoroughly scrubbed with soap and water and 1 to 1000 mercuric chloride solution, and securely bound in sterile gauze, which is not to be disturbed until all is ready for the operation, which is to be done under strict aseptic precautions.

Final Preparations of the Surface to Receive the Grafts.—Sclerosed or cicatrized borders are cut away and granulations rapidly scraped off with a large, dull curette. Bleeding is rapidly staunched by elevation of the part when practicable, as in the case of an extremity, and compression with sterile sponges. A sterile dressing is then bound on or maintained in place by an assistant.

Removal of the Grafts.—If the operation be of any extent a general anesthetic will probably be required. The thigh or other surface is again washed with a mercuric chloride solution and covered with gauze wrung out of the same, over which are secured sterile towels to be turned back at the last moment. After this, and until the completion of the operation, no antiseptic is used, but only a sterile physiological salt solution (NaCl, 6 to 1000). Four basins of this should be at hand: one for the hands (which, of course, have been carefully prepared), one for gauze sponges, one for strips of rubber tissue (to be described later), and one for the grafts.

The surface being exposed, the operator takes a keen razor, ground flat on one side. An assistant makes the skin tense transversely, using both hands. The operator

makes longitudinal tension with the left hand at the upper end of the surface and shaves off the graft downward with a short, sawing motion, the blade being held at a moderate angle to the skin. The grafts may be one-half inch or more in width, as long as one chooses or the surface will allow, and should include a part of the corium. When cut they are dropped into the salt solution, where they curl up, superficial surface outside.

Application of the Grafts.—All oozing having ceased from the surface to be grafted, the grafts are taken up, one end straightened out with the help of a probe and laid on the surface, and the rest of the graft unrolled. It may then be adjusted in place. Subsequent grafts are carefully apposed. There is no harm in a little overlapping, although the overlapping border will naturally die off. The whole surface being covered, it is gently douched with salt solution.

Subsequent Dressing.—Strips of rubber tissue should be in readiness. These should be three-quarters of an inch wide and long enough to overlap the edge of the wound at each side. They should be washed with soap and water, soaked in sublimate solution, and transferred to the salt solution. These are now carefully laid over the grafts without disturbing them, each strip being overlapped by the next, until all is covered. A wet gauze bandage applied with moderate pressure serves to hold them in place. Over this is laid gauze wrung out of the salt solution and covered with a sheet of rubber tissue to prevent evaporation. Sublimate gauze cotton and a bandage complete the dressing, although in case of an extremity a splint should be used to secure immobilization. The surface from which the grafts have been taken will do well under a simple, sterile dressing.

The dressings on the grafted surface should be changed every two days for the first eight days. The outer sheet of rubber tissue had best be omitted after the sixth day, the strips after the tenth, after which a piece of cloth spread with lanolin or vaselin may be applied for a few days.¹

¹The technique here prescribed closely follows that given by Theodore Dunham in the last edition of Buck's Reference Handbook.

HOT AIR.

Lang employed this agent in lupus erythematosus. His apparatus is heated by benzine, and is similar in principle to the Paquelin cautery. It is claimed that this method is free from unpleasant consequences to the patient, that it is simple and easy of application, even to large areas, that healing is rapid, and resultant scars smooth, soft, and supple.

In Hollaender's device for the treatment of lupus vulgaris an air blast is projected through a narrow metal tube, to which heat is applied, the air being raised to a temperature of 300° C. or more, giving a cauterant effect. The patient is placed under a general anesthetic. Much care and skill are required in the use of this method, which is capable of great harm. The regulation of the temperature presents a serious difficulty. It is claimed that a case has been practically cured in one sitting.

Haralamb has employed the method in chancroid.

PASSIVE HYPEREMIA. BIER'S METHOD.

Bier's treatment of local infections by the production of a passive hyperemia was originally applied to tuberculous arthritis, but has recently been employed in a variety of conditions. Bier recognized a therapeutic effect in inflammation and its attendant edema, and sought to reproduce the latter condition by obstructing the return circulation. In the case of infection of an extremity, as, for example, in whitlow, an elastic bandage is applied at a considerable distance, namely, about the arm. Doubtless the method operates by causing an increased phagocytosis, the increased amount of lymph accumulated in the part bringing an increased local supply of opsonins. Cupping glasses of various sizes are used where a constricting bandage is not practicable, as about the face.

The method has been successfully employed in panaris, cellulitis, and more recently, by Moschkowitz, in acne. A small cupping glass operated by a rubber bulb is applied for a minute or two at a time, such applications being repeated at brief intervals during the space of one hour. Sitzings are given daily, improvement being generally apparent in from two to five days.

Stelwagon has long employed the cupping glass in acne to facilitate the emptying of small pus foci.

LIQUID AIR AND SOLIDIFIED CARBON DIOXIDE.

Air liquefies at 220° F. below zero under a pressure of thirty-nine atmospheres. Several processes have, however, been devised which, by securing lower temperatures, attain the same result at less than half the pressure, and are, therefore, simpler and less costly of application. Thus, by the apparatus invented in 1893 by Chas. E. Tripler, of New York, the product may be manufactured at a cost of two cents a pound.

Liquid air, which boils at about 313° F. below zero, is kept and transported in specially constructed glass flasks, having a double wall enclosing a vacuum. A stopper such as would prevent evaporation would only result in an explosion. Cotton is loosely fitted into the open mouth of the flask, and the fluid may thus be transported across the country, meanwhile constantly evaporating. The loss, while great, is not so rapid as to make transportation impracticable.

If it be at any time necessary to filter the air, it may be done in the usual way with ordinary filter paper and an open funnel.

The method of application is quite simple. A piece of absorbent cotton wrapped about the end of a wooden holder is plunged into the liquid, and applied to the affected area with moderate pressure for from two to eight seconds, according to the depth of destruction desired.

The tissue is frozen and becomes snow-white, of stony hardness, and is depressed one-eighth of an inch or more below the surrounding surface. The pain is not severe at the moment of application, but is felt more within the ensuing quarter of an hour or so, after the tissues have thawed and the blood finds its way back into them. The area is then red, somewhat indurated, and presents within a few hours a bleb. The later course of the induced lesion varies with the depth of destruction obtained.

Solidified Carbon Dioxide.—This is employed for similar purposes by W. A. Pusey and others. The liquid gas may be had in cylinders fitted with a valve and ready for use. The cylinder containing 20 pounds is convenient for the use of the physician. The valve being opened and gas allowed to escape, its temperature is rapidly still further lowered and condensation takes place in the form of a miniature snow-storm. Pusey advises that the drum be tilted at an angle of 30 degrees, the opening at the lower end, and the stream directed into a chamois-skin bag, when enough of the material may be collected and kneaded into a little snowball. This is applied directly to the part, being held between the bare fingers without damage to the operator. This immunity is due in part to the thickness of the volar epidermis and in part to the formation of a protective layer by volatilization of the gas. Moderate pressure is employed. Five seconds will suffice for a rubefacient, ten for a vesicant, and fifteen for an escharotic effect. Solid carbon dioxide is about half as cold as liquid air.

These agents are recommended in fibrous nevi, while in vascular nevi, both plane and cavernous, excellent cosmetic results are obtained with liquid air. They are also used successfully in other benign congenital growths, and in a variety of small neoplasms. The method is not recommended in lupus vulgaris. Foul ulcers may be cleaned off by a single application. Liquid air does well in small epitheliomata.

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